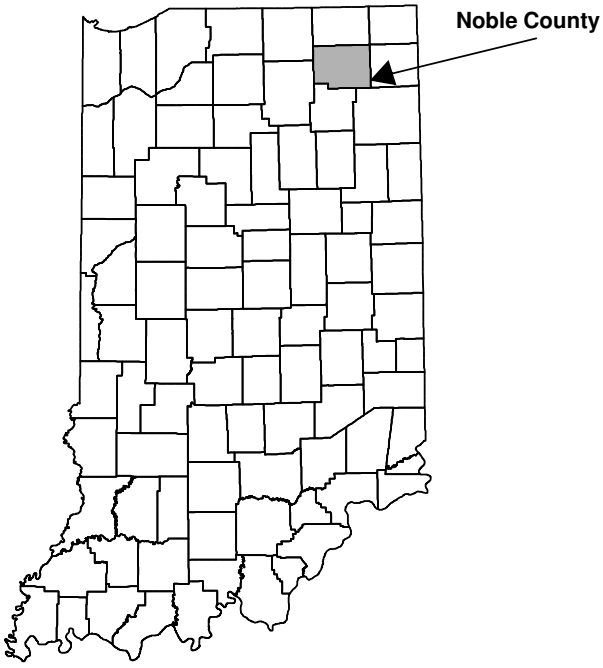
FLOOD INSURANCE STUDY

NOBLE COUNTY, INDIANA
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
ALBION, TOWN OF	180184
AVILLA, TOWN OF	180630
*CROMWELL, TOWN OF	180631
KENDALLVILLE, CITY OF	180185
LIGONIER, CITY OF	180186
NOBLE COUNTY (unincorporated areas)	180183
ROME CITY, TOWN OF	180385
*WOLCOTTVILLE, TOWN OF	185216

* No Special Flood Hazard Areas Identified



PRELIMINARY:

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
18113CV000A

NOTICE TO FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and check the Community Map Repository to obtain the most current FIS report components.

Selected Flood Insurance Rate Map panels for this community contain information that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels (e.g., floodways, cross sections). In addition, former flood hazard zone designations have been changed as follows:

Old Zone:	New Zone:
A1 through A30	AE
B	X (Shaded)
C	X

Initial Countywide FIS Effective Date: TBD

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EXHIBITS

Exhibit 1 - Flood Profiles Panel #s

Bixler Lake Ditch 01P – 02P
Black Creek 03P – 06P
Branch Creek 07P – 09P
Carrol Creek 10P – 12P
Crane Lake Ditch 13P
Croft Ditch 14P – 16P
Diamond Lake Ditch 17P – 18P
Dry Run 19P – 21P
Eley Drain 22P – 23P
Elkhart River 24P – 27P
Forker Creek 28P
Gilbert Lake Ditch 29P
Henderson Lake Ditch 30P – 33P
Huston Ditch 34P – 37P
Lash Ditch 38P
Little Cedar Creek 39P – 40P
Little Elkhart Creek 41P – 43P
Long Lake Ditch 44P – 47P
North Branch Elkhart River 48P – 54P
Rimmel Ditch 55P – 58P
Solomon Creek 59P – 66P

EXHIBITS

Exhibit 1 - Flood Profiles (continued)	Panel #s
South Branch Elkhart River	67P – 72P
Sparta Lake Ditch	73P – 77P
Sycamore Creek	78P – 81P
Tippecanoe River	82P – 86P
Turkey Creek	87P – 90P
Van Gorder Drain	91P – 92P
Waterhouse Ditch	93P – 95P
Willow Creek	96P – 99P
Winebrenner Branch	100P – 101P

Exhibit 2 - Flood Insurance Rate Map Index

Flood Insurance Rate Map

FLOOD INSURANCE STUDY
NOBLE COUNTY, INDIANA AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and supersedes the FIS reports and Flood Insurance Rate Maps (FIRMs) in the geographic area of Noble County, Indiana, including the Cities of Kendallville and Ligonier, the Towns of Albion, Avilla, Cromwell, Rome City, and Wolcottville, and the unincorporated areas of Noble County (hereinafter referred to collectively as Noble County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. This information will also be used by Noble County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

The Digital Flood Insurance Rate Map (DFIRM) and FIS report for this countywide study have been produced in digital format. Flood hazard information was converted to meet the Federal Emergency Management Agency (FEMA) DFIRM database specifications and Geographic Information System (GIS) format requirements. The flood hazard information was created and is provided in a digital format so that it can be incorporated into local GIS and be accessed more easily by the community.

Furthermore, the Towns of Cromwell and Wolcottville do not have special flood hazard areas within their incorporated limits. However, for the purpose of complete countywide mapping of Noble County, these towns are still included in this FIS and FIRMs.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

Information of the authority and acknowledgements for each of the new studies and previously printed FIS reports and Flood Insurance Rate Maps (FIRMs) for communities within Noble County was compiled and is shown below:

Kendallville, City of: The hydrologic and hydraulic analyses for this study were performed by the U.S. Department of Agriculture, Soil Conservation Service, for the Federal Emergency Management Agency, under Inter-Agency Agreement IAA-H-11-79. Hydrologic and hydraulic analyses for flooding outside the corporate limits but within the extraterritorial limits of the City of Kendallville were taken from the Unincorporated Areas of Noble County Flood Insurance Study (Reference 1). This study was completed in June 1981.

Ligonier, City of: The hydrologic and hydraulic analyses for this study were performed by the U.S. Department of Agriculture, Soil Conservation Service, for the Federal Emergency Management Agency, under Inter-Agency Agreement IAA-H-11-79. Hydrologic and hydraulic analyses for flooding outside the corporate limits but within the extraterritorial limits of the City of Ligonier were taken from the Unincorporated Areas of Noble County Flood Insurance Study (Reference 1). This study was completed in June 1981.

Noble County (unincorporated areas): The hydrologic and hydraulic analyses for this study were performed by the U.S. Soil Conservation Service for the Federal Emergency Management Agency, under Inter-Agency Agreement IAA-H-18-75, Project Order No. 5, supplemented by Inter-Agency Agreement No. IAA-H-8-77, Project Order No. 3. This work, which was completed in December 1976, covered all significant flooding sources in Noble County.

Rome City, Town of: The hydrologic and hydraulic analyses for this study were performed by the U.S. Department of Agriculture, Soil Conservation Service, for the Federal Emergency Management Agency, under Inter-Agency Agreement

IAA-H-11-79, Project Order No. 13. This study was completed in June 1981.

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New Studies: The hydrologic and hydraulic analyses for approximate stream reaches of Noble County were performed by Christopher B. Burke, Ltd., on behalf of the Indiana Department of Natural Resources and Maumee River Basin Commission. The Indiana Department of Natural Resources managed the production of this study as part of their Cooperating Technical Partner agreement with the Federal Emergency Management Agency dated April 29, 2004, which was defined by the Indiana DNR Mapping Activity Statement 07-17 dated July 17, 2007 and funded under agreement number EMC-2007-CA-7027.

Redelineation of the previously effective flood hazard information for this FIS report, correction to the North American Vertical Datum of 1988, and conversion of the unincorporated and incorporated areas of Noble County into the Countywide format was performed by Christopher B. Burke, Ltd., on behalf of the Indiana Department of Natural Resources and Maumee River Basin Commission, under Indiana Public Works Project Number --. The Indiana Department of Natural Resources managed the production of this study as part of their Cooperating Technical Partner agreement with the Federal Emergency Management Agency dated April 29, 2004, which was defined by the Indiana DNR Mapping Activity Statement 07-17 dated July 17, 2007 and funded under agreement number EMC-2005-GR-7022.

1.3 Coordination

The purpose of an initial Consultation Coordinated Officer's (CCOs) meeting is to discuss the scope of the FIS. A final CCO meeting is held to review the results of the study. The dates of the initial and final CCO meetings held for the previously effective FIS reports covering the geographic area of Noble County, Indiana are shown in Table 1 (References 1). The initial and final CCO meetings were attended by the study contractor, FEMA (or the Federal Insurance Administration), the Indiana Department of Natural Resources (IDNR), and the affected communities.

Table 1: CCO Meeting Dates for Pre-Countywide FIS

Community Name	Initial CCO Date	Final CCO Date
Noble County, IN (Unincorporated Areas)	January 1975	March 9, 1977
Kendallville, City of	June 6, 1979	January 28, 1982
Ligonier, City of	N/A	December 1, 1981
Rome City, Town of	June 6, 1979	December 1, 1981

For this countywide FIS, an initial CCO meeting was held on August 29, 2006, and was attended by IDNR, the Noble County Plan Commission, the Noble County Surveyor, and the Town of Yorktown.

The results of the countywide study were reviewed at the final CCO meeting held on --, and attended by representatives of FEMA, IDNR and representatives from Noble County. All problems raised at that meeting have been addressed.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Noble County, Indiana, including the incorporated communities listed in Section 1.1

All FIRM panels for Noble County have been revised, updated, and republished in countywide format as a part of this FIS. The FIRM panel index, provided as Exhibit 2, illustrates the revised FIRM panel layout.

Approximate methods of analysis were used to study those areas having a low development potential or minimal flood hazards as identified during the initial CCO meeting. For this study, eleven new stream reaches were studied using approximate methods. The scope and methods of new approximate studies were proposed and agreed upon by FEMA, the IDNR, and Noble County.

This FIS update also incorporates the determination of letters issued by FEMA resulting in map changes (Letters of Map Change, or LOMCs). All Letters of Map Revision (LOMRs) are summarized in Table 2. Channel cross section and bridge data for Willow Creek were field surveyed by the Detroit District COE. Channel cross section and bridge data for Eley Drain, Van Gorder Drain, Black Creek, and Little Cedar Creek were field surveyed by Christopher B. Burke Engineering, Ltd. Letters of Map Amendment (LOMAs) for this study are summarized in the Summary of Map Actions (SOMA) included in the Technical Support Data Notebook (TSDN) associated with this FIS update. Copies of the TSDN may be obtained from the Community Map Repository.

Table 2: Incorporated Letters of Map Change

Flooding Source	Community and Project Id	Date Issued	Type
Willow Creek	180183 (97-05-325P)	March 31, 1998	LOMR
Eley Drain / Van Gorder Drain	180183 (00-05-265P)	September 5, 2001	LOMR

Table 2: Incorporated Letters of Map Change (cont.)

Flooding Source	Community and Project Id	Date Issued	Type
Black Creek / Little Cedar Creek	180183 (01-05-1706P)	May 14, 2002	LOMR

Table 3: Streams Previously Studied by Detailed Methods

Bixler Lake Ditch
Black Creek
Branch Creek
Carrol Creek
Crane Lake Ditch
Croft Ditch
Diamond Lake Ditch
Dry Run
Eley Drain
Elkhart River
Forker Creek
Gilbert Lake Ditch
Henderson Lake Ditch
Huston Ditch
Lash Ditch
Little Cedar Creek
Little Elkhart Creek
Long Lake Ditch
North Branch Elkhart River
Rimmel Ditch
Solomon Creek
South Branch Elkhart River
Sparta Lake Ditch
Sycamore Creek
Tippecanoe River
Turkey Creek
Van Gorder Drain
Waterhouse Ditch
Willow Creek
Winebrenner Branch

Table 4: Streams Previously Studied by Approximate Methods

Bowen Lake
Dock Lake
Long Lake
Miller Lake
Mud Lake
Rivir Lake
Sand Lake
Sucker Lake
Weber Lake

Table 5: Scope of Study

Stream	Limits of Detailed Study
Bixler Lake Ditch	Henderson Lake to Bixler Lake
Lash Ditch	Bixler Lake to County Road 500 North
Stream	**Limits of Redelineation Study**
Black Creek	DeKalb County Line to CR 300 South

Table 5: Scope of Study (cont.)

Stream	Limits of Redelineation Study
Branch Creek	Waldron Lake to Sylvan Lake
Croft Ditch	Mouth to Skinner Lake
Dry Run	Mouth to US 6
Eley Drain	~375' Upstream of Mouth to ~9500' Upstream of Mouth
Elkhart River	Elkhart County Line to Confluence of North and South Branches
Gilbert Lake Ditch	Buckles Lake to Metz Lake
Henderson Lake Ditch	Sylvan Lake to Henderson Lake
Huston Ditch	Mouth to CR 600 North
Little Cedar Creek	DeKalb County Line to DeKalb County Line
Little Elkhart Creek	LaGrange/Noble Co. line to CR 1100 N
Little Elkhart Creek	CR 1100 North to CR 925 East
Long Lake Ditch	Mouth to Lower Long Lake
North Branch Elkhart River	Lagrange County Line to Tamarack Lake
North Branch Elkhart River	Jones Lake to Lagrange County Line
North Branch Elkhart River	Mouth to CR 125 West
Rimmel Ditch	Skinner Lake to CR 500 East
Solomon Creek	Elkhart County Line to 2000' upstream of CR 100 North
South Branch Elkhart River	Mouth to Port Mitchell Lake
South Branch Elkhart River	Port Mitchell Lake to Forker Creek

Table 5: Scope of Study (cont.)

Stream	Limits of Redelineation Study
Sparta Lake Ditch	Mouth to Engle Lake
Sparta Lake Ditch	CR 500 North to Sparta Lake
Sycamore Creek	SR 3 to DeKalb County Line
Tippecanoe River	Bauger Lake to Smalley Lake
Tippecanoe River	Whitley County Line to Big Lake
Tippecanoe River	CR 350 South to Whitley County Line
Tippecanoe River	Kosciusko County Line to Bauger Lake
Turkey Creek	Kosciusko County Line to Villiage Lake
Van Gorder Drain	Approximately 3300' Upstream of Mouth to ~12800'Upstream of Mouth
Waterhouse Ditch	Mouth to Little Long Lake
Willow Creek	Allen County Line to CR 800 East
Various Lakes **	Entire
Stream	Limits of Approximate Study
Bilger Ditch+	Approximately 1600' downstream of CR 1000 East to approximately 1000' downstream of CR 600 East
Black Creek+	CR 300 S to 2600' upstream of CR 300 S
Clock Creek	CR 175 East to approximately 400' downstream of St Rd 9
Little Cedar Creek +	CR 1200 E to 3000' upstream of C 400 N
Sycamore Creek & Unnamed Trib. Sycamore Creek+	St Rd 8/St Rd 3 to CR 800 East
Unnamed Trib. John Diehl Ditch+	CR 1200 E to 2000' upstream CR 1000 E

Table 5: Scope of Study (cont.)

Stream	Limits of Approximate Study
Unnamed Trib. Little Cedar Creek 2+	Little Cedar Creek to Baseline Road
Unnamed Trib. Little Cedar Creek 3+	Noble/DeKalb Co. line to 4000' upstream
Whan Ditch+	Confluence to upstream of Hopewell Road
Willow Creek+	CR 800 E to 2700' upstream of CR 500 S
Yarde Ditch+	B & O Railroad to Noble/DeKalb Co. line

** Various Lakes include: Baugher Lake, Bear Lake, Big Lake, Bixler Lake, Chain O'Lakes, Crooked Lake, Deer Lake, Engle Lake, Henderson Lake, High Lake, Jones Lake, Knapp Lake, Little Long Lake, Lower Long Lake, Muncie Lake, Round Lake, Skinner Lake, Smalley Lake, Sylvan Lake, Upper Long Lake, Waldron Lake, and Williams Lake

+Additional studies funded by the Maumee River Basin Commission (MRBC) included in this revision.

2.2 Community Description

Noble County (412 square miles in area) is located in north-central Indiana and is bordered by LaGrange County to the north, DeKalb County to the east, Whitley and Allen Counties to the south, and Elkhart and Kosciusko Counties to the west. Noble County is located approximately 120 miles northeast of Indianapolis. Noble County is served by US routes 33 and 6, and State Routes 3, 5, 8, and 9. The City of Kendallville is located in northeast Noble County. The Town of Rome City is located in north-central Noble County. The City of Ligonier is located in the northwestern part of Noble County. Many lakes, mostly of natural origin, exist in the county, and are used extensively for water sports and fishing. Cabins and houses often exist near the shorelines of the lakes. Extensive wetlands are an important feature of the landscape and are valuable wildlife habitats.

The Elkhart River is the principal drainage outlet for Noble County. Formed by the confluence of the North Branch Elkhart River and the South Branch Elkhart River at a point about 3.5 miles east of Ligonier, Indiana, the Elkhart River flows northwestward to its junction with the St. Joseph River at Elkhart, Indiana. About 10 miles of this river are in Noble County with about 36 miles downstream of the county line. At the county line the Elkhart River drainage area is 303 square miles. Other

streams within the St. Joseph River sub-basin flowing from Noble County are Little Elkhart Creek, Solomon Creek, and Turkey Creek. Seventy-five percent of the Noble County lies within this sub-basin. Flow characteristics of this area are perennial by nature, due principally to substantial areas of wetlands, natural lakes, and groundwater reservoirs. Comparatively strong low flow discharges and correspondingly temperate peak discharges are experienced. The only major artificial lake is Sylvan Lake at Rome City. The natural stream system in the upper watersheds is largely comprised of channels connecting the many natural lakes. These channels are inherently shallow streams meandering through marsh lands.

The Tippecanoe River drainage area (part of the Wabash River sub-basin of the Ohio River basin) is 36 square miles, makes up approximately 10% of Noble County, and is located in the southwest corner of the bounty. Like the St. Joseph River sub-basin area, flow is perennial and natural lakes are a dominant landscape feature. Wilmot Pond is the only major artificial lake.

In the southeast corner of the county, Sycamore Creek, Little Cedar Creek, Black Creek, and Willow Creek all drain to the Maumee River sub-basin of the Great Lakes basin. Fifteen percent of the county lies in this sub-basin. Little Cedar Creek has headwaters in adjacent Dekalb County and after only about two miles in Noble County returns to Dekalb County. This stream has about 35 square miles of drainage area in the study area. The other three streams mentioned above originate in Noble County. There are virtually no natural lakes in this part of the county; topography is more rolling and consequently fluctuation in stream flow is more pronounced.

Bixler Lake Ditch flows westerly through south-central Kendallville and turns north at the west edge of the golf course. North of the railroad tracks, part of its waters is diverted into Henderson Lake and the rest enters Henderson Lake Ditch. The drainage area for Bixler Lake Ditch at Henderson Lake is approximately six square miles. Waterhouse Ditch flows westerly through northern Kendallville and drains into Henderson Lake Ditch west of the city.

Sylvan Lake lies within the town limits of Rome City. Many residential buildings occupy the shoreline of the lake. Henderson Lake Ditch drains into Sylvan Lake at the east edge of Rome City. Sylvan Lake discharges into Branch Creek near the west side of Rome City. Branch Creek joins the North Branch Elkhart River at Jones and Waldron Lakes.

Sparta Lake Ditch joins the Elkhart River on the east edge of Ligonier. Its drainage area is 4.7 square miles. Solomon Creek flows in a northwesterly direction within the southwestern portion of Ligonier's extraterritorial limits. Its drainage area is 16.2 square miles.

Land use in the flood plains of unincorporated Noble County is of relatively low agricultural intensity with about one-fourth in cropland. The wetlands occupy about one-third of the flood plain and are marshy or swamped areas. Grassland, forest land

and other land account for the balance. Several residences and a few businesses are located in flood-prone areas throughout the county. Concentrations of houses in flood-prone areas occur near certain lakes.

Land use in the floodplain of Henderson Lake Ditch is relatively low in agricultural intensity; Bixler Lake Ditch and Lash Ditch flood plains consists of a golf course, industrial and residential areas, a school playground, a city park, and wetlands.

The climate in Noble County ranges from hot and humid in the summertime to cold during the winter season. Average daytime temperatures during the summer fall around 69.6 ºF, while winter temperatures average at approximately 24.7ºF. Precipitation for Noble County totals an annual amount of 37.30 inches.

According to U.S. Census Data from the year 2000, the population of Noble County was reported to be 46,275. Table 6 lists the population of the incorporated areas in Noble County.

Table 6: Population of incorporated cities and towns in Noble County (2000 Census)

Community	Population
Albion, Town of	2,284
Avilla, Town of	2,049
Cromwell, Town of	452
Kendallville, City Of	9,616
Ligonier, City Of	4,357
Rome City, Town Of	1,615
Wolcottville, Town Of	933

2.3 Principal Flood Problems

Major flooding in Noble County primarily occurs along the North Branch Elkhart River and its tributaries. Major floods principally occur during the winter and spring months, but can occur during any season. Generally, two types of storm events cause flooding. During the winter and spring, storms of moderate intensity and long duration, coupled with frozen ground, cause flooding to occur. During the summer, thunderstorms which have high intensities and relatively short durations can cause floods. Localized flood problems in the incorporated areas are summarized below:

Albion, Town of: The discharges and flood elevations on floods at the gaging stations on the Rimmel Ditch near Albion are as follows:

Table 7: Flood Crest Elevations
USGS gage for Rimmel Ditch near Albion

Year	Discharge Cubic Feet Per Second (CFS)	Elevation (feet, gage datum)
1980	495	9.88
1981	397	12.82
1982	360	12.31
1985	414	11.51
1986	418	11.55
1991	385	11.22
1996	359	12.31

Burr Oak, Town of: The discharges and flood elevations on floods at the gaging stations on Forker Creek near Burr Oak are as follows:

Table 8: Flood Crest Elevations
USGS gage for Forker Creek near Burr Oak

Year	Discharge Cubic Feet Per Second (CFS)	Elevation (feet, gage datum)
1976	179	4.82
1978	238	5.67
1979	178	4.90
1981	328	6.60
1982	338	6.71
1983	185	4.90
1985	480	7.00
1986	233	6.02
1987	181	5.37
1990	218	5.77
1991	323	7.03
1993	254	6.27
1999	206	5.71

Cosperville, Town of: The discharges and flood elevations on floods at the gaging stations on the North Branch Elkhart River at Cosperville are as follows:

Table 9: Flood Crest Elevations
USGS gage for North Branch Elkhart River near Cosperville

Year	Discharge Cubic Feet Per Second (CFS)	Elevation (feet, gage datum)
1974	569	6.84
1976	587	7.25
1978	682	7.41
1981	568	7.42
1985	834	7.51
1990	545	6.38
1991	643	7.01
1993	839	7.60
1996	576	6.61
1997	576	6.86
1998	688	7.61
1999	561	7.21
2005	519	6.53

Kendallville, City of:

Forty years of records show that damaging floods have occurred in March 1939, May 1943, April 1950, July 1951, October 1954, February 1956, April 1956, December 1966 and February 1968. Of these floods, the largest were 1943 1950, 1951 and 1954 events. The magnitude of these floods ranges from 20- to 30-year recurrence intervals. Floods during the 1960 through 1976 period have been relatively small in comparison with the past and with what can be expected in the future. The discharges and flood elevations on floods at the gaging stations on the Wible Lake Inlet near Kendallville are as follows:

Table 10: Flood Crest Elevations
USGS gage for Wible Lake Inlet near Kendallville

Year	Discharge Cubic Feet Per Second (CFS)	Elevation (feet, gage datum)
1976	28.0	4.25
1977	35.0	4.51
1980	48.0	5.51
1981	36.0	5.37
1982	50.0	5.87

2.4 Flood Protection Measures

There are no National Flood Insurance Program approved flood control structures showing protection from the mapped floodzone.

Precounty-wide studies: Stream gaging station records of the North Branch Elkhart River near Cosperville, and the Elkhart River at Goshen were the principal sources of data for defining discharge-frequency relationships for the studied streams. Discharges were statiscally analyzed principally by the Log-Pearson type III distribution of annual peak flow data.

Stream channel clearance along 18 miles of the North Branch, South Branch, and main stem of Elkhart River was done in 1975. This work was accomplished through financial sponsorship by Title 10, Public Works and Economic Development Act of 1965, as amended. Debris was removed from these streams and trees growing on stream banks where potential snagging problems existed were cut and removed to allow more efficient water flow. The effects of the above work were accounted for in this Flood Insurance Study.

The Elkhart River Basin, Indiana, Report on Water and Related Land Resources, recommended 0.6 mile of channel work for flood control and increased recreation along Turkey Creek near the outlet of Knapp Lake. This report also recommended 2.2 miles of channel work on Carrol Creek west of Muncie Lake. The effects of work stemming from these two recommendations were not accounted for in performing this Flood Insurance Study as no construction has been authorized.

The Tippecanoe River in Noble County was excavated many years ago at most locations between lakes to lower the original water-surface for improved drainage of surrounding fields. Other stream channels removed from the lakes have been straightened and deepened to facilitate improved drainage of adjacent fields.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in Noble County, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent-annual-chance flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-

year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting Noble County. Table 11 contains a summary of peak discharges for the 10-, 2-, 1-, and 0.2-percent annual chance floods, where applicable, for each flooding source studied in detail in Noble County. Peak discharges for Bixler Lake Ditch and Lash Ditch were computed using GeoHMS tools in ArcGIS which was then imported into HEC-HMS. Peak discharges for all other streams in the table were compiled from previously effective FIS reports for Noble County and incorporated areas.

Table 11. Summary of Discharges

Flooding Source And Location	Drainage Area (Square Miles)	Peak Discharge (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
BIXLER LAKE DITCH					
Outlet	5.99	90	120	140	200
Weston Avenue	5.37	50	70	90	120
BLACK CREEK					
County Boundary	21.3	930	***	1,650	***
Below confluence with Bilger Drain	19.1	860	***	1,525	***
Above confluence with Bilger Drain	2.4	160	***	280	***
BRANCH CREEK					
County Road 150 East	33.6	267	344	382	458
CARROL CREEK					
County Road 250 West	18.1	252	324	360	432
State Road 109	7.85	84	108	120	144
CRANE LAKE DITCH					
Cross Section A	2.6	36	47	52	62

Table 11. Summary of Discharges (cont.)

Flooding Source And Location	Drainage Area (Square Miles)	Peak Discharge (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
CROFT DITCH					
County Road 75 West	23.9	469	603	670	804
County Road 150 East	15.9	333	428	475	570
DIAMOND LAKE DITCH					
County Road 475 West	4.8	60	77	86	103
Cross Section A	1.0	18	23	25	30
DRY RUN					
County Road 900 North	7.45	196	252	280	336
County Road 100 East	6.30	172	221	245	294
ELEY DRAIN					
Outlet	1.54	256	385	441	600
Conrail	1.25	203	305	351	470
County Road 100 North	0.98	170	256	294	400
County Road 900 East	0.43	72	110	126	170
ELKHART RIVER					
Downstream County Boundary	303	1,670	2,150	2,390	2,870
Bridge Street	290	1,560	1,990	2,220	2,660
425 North Road	289	1,550	1,980	2,210	2,640
County Road 600 West	278	1,460	1,880	2,090	2,510
FORKER CREEK					
County Road 50 West	19.4	165	212	235	282
GILBERT LAKE DITCH					
County Road 250 West	1.6	25	32	36	43
HENDERSON LAKE DITCH					
County Road 850 North	18.5	161	207	230	276
Cross Section L	15.4	140	180	200	240
Kendallville Corporate Limits	9.59	95	125	139	170
State Road 3	7.09	75	100	111	135
HUSTON DITCH					
County Road 300 West	8.0	203	261	290	348
County Road 600 North	5.0	144	185	205	246
LASH DITCH					
Outlet	2.47	150	230	270	390
Confluence with UNT	1.85	100	160	190	280
LITTLE CEDAR CREEK					
Below confluence with Hinkley Ditch	31.0	1,275	***	2,250	***
County Boundary	25.4	1,080	***	1,900	***

Table 11. Summary of Discharges (cont.)

Flooding Source And Location	Drainage Area (Square Miles)	Peak Discharge (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
LITTLE ELKHART CREEK					
Cross Section A	21.0	175	225	250	300
State Route 3	10.3	102	131	145	174
County Road 1000 North	3.5	45	58	64	77
LONG LAKE DITCH					
County Road 200 North	4.35	53	68	76	91
Cross Section L	2.08	30	39	43	52
NORTH BRANCH ELKHART RIVER					
Cross Section A	163	826	1,060	1,180	1,420
County Road 300 West	144	742	954	1,060	1,270
County Road 125 West	134	700	900	1,000	1,200
Study Limits	62.4	392	504	560	672
RIMMEL DITCH					
Cross Section A	11.8	532	684	760	912
State Route 8	6.25	329	423	470	564
SOLOMON CREEK					
1050 West Road	16.2	343	441	490	588
Cross Section J	12.0	280	360	400	480
Cross Section V	1.8	67	86	96	115
SOUTH BRANCH ELKHART RIVER					
U.S. Highway 6	114	630	810	900	1,080
County Road 300 North	92	735	945	1,050	1,260
County Road 100 North	46.5	322	414	460	552
County Road 100 South	45.1	312	401	445	534
SPARTA LAKE DITCH					
Union Street	4.7	55	71	79	95
U.S. Highway 6	4.22	52	67	74	89
Cross Section N	1.04	18	23	25	30
SYCAMORE CREEK					
Cross Section B	6.15	322	414	460	552
Cross Section J	3.98	238	306	340	408
TIPPECANOE RIVER					
State Route 5	35.2	259	333	370	444
County Road 700 West	23.0	210	270	300	360
County Road 470 West	9.9	102	131	145	174
Cross Section Z	1.5	24	31	34	41

Table 11. Summary of Discharges (cont.)

Flooding Source And Location	Drainage Area (Square Miles)	Peak Discharge (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
TURKEY CREEK					
Cross Section B	12.5	119	153	170	204
Cross Section K	6.02	68	87	97	116
VAN GORDER DRAIN					
Conrail	1.44	247	373	428	590
County Road 1100 East	1.08	175	265	304	420
County Road 1000 East	0.35	23	41	50	81
WATERHOUSE DITCH					
0.5 miles downstream of Lima Road	5.8	67	86	95	114
East 900 Road	4.6	55	71	79	95
WILLOW CREEK					
Just upstream of Confluence with Yart Drain	8.62	430	550	600	720
Cross Section H	6.11	326	419	465	558
WINEBRENNER BRANCH					
County Road 300 West	6.74	182	234	260	312
U.S. Highway 33	3.10	102	131	145	174

*** Data not available

Standard and accepted hydrologic methods were used to develop discharge data on the study streams in Noble County. The equations used to determine the discharges in the majority of the cases are taken from Estimation of Peak Discharges of Indiana Streams by using log Pearson (iii) distribution. The equations presented in the report are also included in the latest version of the National Flood Frequency (NFF) program by the USGS, and are included in the USGS StreamStats application. In some cases, the discharges for a stream have been coordinated with the Indiana Department of Natural Resources, the Natural Resources Conservation Service (formally the Soil Conservation Service), the U.S. Geological Survey and the U.S. Army Corps of Engineers, through a Memorandum of Understanding dated May 6, 1976.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the Flood Insurance Rate Map (FIRM) represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data table in

the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to us the flood elevation data presented in this FIS report in conjunction with the data shown on the FIRM.

Cross sections for the backwater analyses were obtained from a variety of sources including: physical survey data, IDNR contour mapping, USGS topographic mapping and local contour mapping. Photogrammetric methods were adapted to develop a two-foot contour interval topographic for the Elkhart River and its floodplain for the previous City of Ligonier study, and Henderson Lake Ditch & Waterhouse Ditch for the previous City of Kendallville study.

For the new approximate study reaches, the USACE HEC-RAS program was used. HEC-RAS is an updated version of the HEC-2 program used to perform step-backwater analyses.

Precounty-wide studies: Starting water surface elevations for a tributary of a studied stream or lake were taken from flood frequency profiles of the receiving water at the junction. Concurrent flood peaking of the tributary and receiving waters was assumed. Within the backwater area from a receiving stream, computed profiles for a tributary show very little increase in flood heights above backwater elevations. Water-surface elevations for floods of the selected recurrence intervals were computed through use of the SCS (currently NRCS) WSP-2 step-backwater computer program. Likewise, the computed profiles generally reached normal depth within a short distance upstream of backwater locations further justifying use of concurrent flood peaks at junctions. Water surface slope for normal flow was used for starting flood profiles for streams finding outlets beyond the Noble County line. From this slope the normal depth was computed at the starting cross section. The starting section was sufficiently far downstream to assure accurate profile elevations where computations reached the study area.

Little Lake elevations are based on the upstream end of the Branch Creek study. Bixler Lake elevations were based on lake gage data records. The 0.2% frequency elevation was revised based on the revised study for Lash Ditch

Table 12: Stillwater Elevations

Flooding Source	Static Base Flood Elevation (feet NAVD 88)
Baugher Lake	882.3
Bear Lake	895.9
Bixler Lake	966.1
Big Lake	901.5
Crooked Lake	906.7
Engle Lake	879.3

Table 12: Stillwater Elevations (cont.)

Flooding Source	Static Base Flood Elevation (feet NAVD 88)
High Lake	898.3
Jones Lake	890.0
Knapp Lake	880.7
Little Lake	894.1
Little Long Lake	954.3
Lower Long Lake	891.5
Muncie Lake	890.3
Round Lake	954.3
Skinner Lake	933.7
Smalley Lake	887.1
Sylvan Lake	918.8
Upper Long Lake	893.2
Waldron Lake	890.0
Williams Lake	890.1

For this revision: The Bixler Lake Ditch and Lash Ditch detailed studies, two-foot contours of the area and manually drawn cross-sections were manipulated in ArcGIS using HEC-GeoRAS tools. This data was then imported into HEC-RAS to compute the water surface elevations.

Sylvan Lake elevations were revised based on the hydraulic modeling for the Emergency Action Plan for Sylvan Lake Dam.

Flood profiles were prepared for all streams studied by detailed methods and show computed water-surface elevations to an accuracy of 0.5 feet for floods of the selected recurrence intervals. For this countywide FIS, flood profiles and approved LOMRs have been consolidated into continuous stream reaches and adjusted to reflect the current vertical datum as described in Section 3.3. New profiles have been prepared for the new detailed studies and for the purposes of incorporating the LOMRs described in Section 2.1 above.

Channel and overbank roughness factors (Manning's "n" values) used in the hydraulic computations were chosen by engineering judgment and were based on field observations of the stream and floodplain areas. For Bixler Lake Ditch and Lash Ditch, n-values were estimated from field observations and aerial photographs. Channel and overbank roughness factors used in the detailed studies are summarized by stream in Table 13.

Table 13. Channel and Overbank Roughness Factors

Stream	Roughness Coefficients: Main Channel	Roughness Coefficients: Overbanks
Bixler Lake Ditch	0.045 – 0.055	0.06 – 0.085
Black Creek	0.05 -0.09	0.06 – 0.12
Branch Creek	0.055	0.055 – 0.12
Carrol Creek	0.05 – 0.08*	0.07 – 0.10
Crane Lake Ditch	0.07*	0.07
Croft Ditch	0.05 – 0.06	0.06 – 0.12
Diamond Lake Ditch	0.05 – 0.075*	0.05 – 0.10
Dry Run	0.05 – 0.08	0.07 – 0.10
Elkhart River	0.05	0.05 – 0.12
Forker Creek	0.06*	0.07 – 0.10
Gilbert Lake Ditch	0.045 – 0.05*	0.06 – 0.07
Henderson Lake Ditch	0.03 – 0.08*	0.06 – 0.10
Huston Ditch	0.05 – 0.12	0.06 – 0.12
Lash Ditch	0.06 – 0.075	0.08 – 0.09
Little Cedar Creek	0.07*	0.07 – 0.10
Little Elkhart Creek	0.07*	0.07 – 0.12
Long Lake Ditch	0.05 - 0.07*	0.07 - .012
North Branch Elkhart River	0.03 – 0.06*	0.07 – 0.10
Rimmel Ditch	0.05 – 0.07	0.07 – 0.12
Solomon Creek	0.05 – 0.08*	0.06 – 0.10
South Branch Elkhart River	0.05 – 0.07*	0.06 – 0.12
Sparta Lake Ditch	0.05 – 0.10*	0.07 – 0.10
Sycamore Creek	0.05 – 0.11	0.07 – 0.12
Tippecanoe River	0.05 – 0.075*	0.05 – 0.12
Turkey Creek	0.05 – 0.08*	0.06 – 0.08
Waterhouse Ditch	0.05 – 0.07	0.06 – 0.08
Willow Creek	0.07 – 0.09	0.07 – 0.09
Winebrenner Branch	0.045 – 0.07	0.07 – 0.09

*0.02 Channel “n” for Lakes

For new Zone A study areas, analyses were based on field inspection and modeling of the stream reaches using simplified HEC-RAS models. Structural measurements or field surveying was not performed. Cross section geometry was derived from the 2005 statewide orthophotography project with a maximum spacing of 100 feet. Starting elevations were assumed to be normal depth.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the Flood Profiles (Exhibit 1) are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

3.3 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the finalization of the North American Vertical Datum of 1988 (NAVD88), many FIS reports and FIRMs are being prepared using NAVD88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD88. Structure and ground elevations in the community must, therefore, be referenced to NAVD88. It is important to note that adjacent communities may be referenced to NGVD29. This may result in differences in Base Flood Elevations (BFEs) across the corporate limits between the communities.

In this revision, a vertical datum conversion of -0.46 feet was calculated at the centroid of the county and used to convert all elevations in Noble county from NGVD29 to NAVD88 using the National Geologic Survey's VERTCON online utility (VERTCON, 2005).

(NGVD29 – 0.46 = NAVD88)

For more information on NAVD88, see the FEMA publication entitled Converting the National Flood Insurance Program to the North American Vertical Datum of 1988 (FEMA, June 1992), or contact the Vertical Network Branch, National Geodetic Survey, Coast and Geodetic Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland 20910 (Internet address http://www.ngs.noaa.gov).

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

The coordinate system used for the production of the digital FIRMs is the Transverse Mercator projection, Indiana State Plane coordinate system, East Zone, referenced to the North American Datum of 1983 and the GRS 1980 spheroid.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 1-percent-annual-chance flood elevations and delineations of the 1- and 0.2-percent-annual-chance floodplain

boundaries and 1-percent-annual-chance floodway to assist communities in developing floodplain management measures. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, and the Floodway Data table. Users should reference the data presented in the FIS report as well as additional information that may be available at the local map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic mapping from the City of Muncie and from the 2005 statewide orthophotography flight.

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, V, and VE); and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1-percent-annual chance floodplain boundary is shown on the FIRM (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as

minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The State of Indiana, however, per Indiana Code IC 14-28-1 and Indiana Administrative Code 312 IAC 10, has designated that encroachment in the floodplain is limited to that which will cause no significant increase in flood height. Typically, floodways for this study are delineated based on a flood surcharge of less than 0.15 feet.

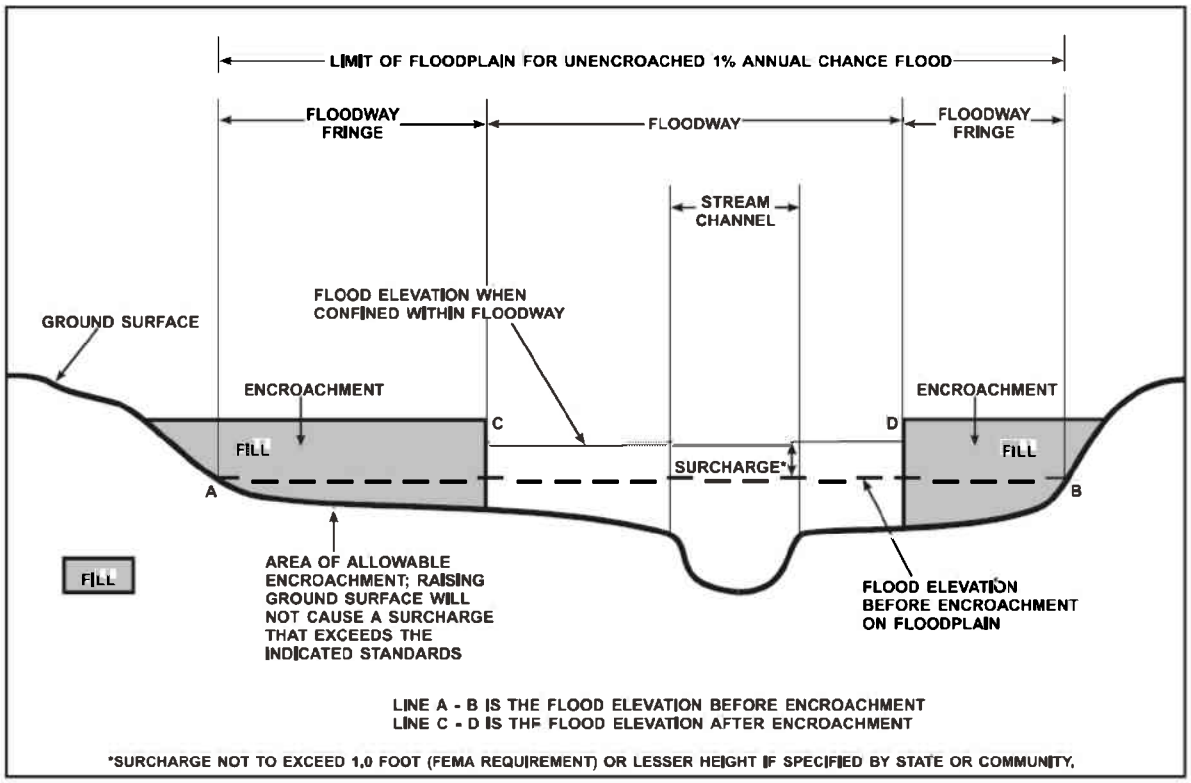
However, for the precounty-wide studies complete from February 1978 to July 1982, a floodway having no more than a 0.2 foot surcharge has been delineated with the approval of the Natural Resources Commission of the IDNR. The floodways in this study were approved by the IDNR, and are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodway presented in this FIS report and on the FIRM was computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations have been tabulated for selected cross sections (Table 14). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary has been shown.

A floodway designation generally is not appropriate in areas which may be inundated by flood waters over wetlands and where no channel is apparent. Thus, no floodways were prepared for selected areas along the following streams: Carrol Creek, Crane Lake Ditch, Diamond Lake Ditch, Forker Creek, Gilbert Lake Ditch, Henderson Lake Ditch, Little Elkhart Creek, Long Lake Ditch, North Branch Elkhart River, Rimmel Ditch, Solomon Creek, South Branch Elkhart River, Sparta Lake Ditch, Tippecanoe River, Turkey Creek, and Waterhouse Ditch.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent-annual-chance flood more than 0.14 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

Figure 1: Floodway Schematic



FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE (FEET)
BIXLER LAKE DITCH								
A	827	20	113	1.2	955.8	955.8	955.9	0.1
B	1,753	53	191	0.9	956.2	956.2	956.3	0.1
C	2,500	19	99	1.4	957.3	957.3	957.4	0.1
D	3,179	17	52	3.2	958.3	958.3	958.3	0.0
E	3,814	337	1590	0.1	960.7	960.7	960.8	0.1
F	5,047	90	197	0.7	960.7	960.7	960.8	0.1
G	5,841	17	67	1.4	961.7	961.7	961.8	0.1
H	6,668	19	88	1.0	963.2	963.2	963.2	0.0
I	7,483	34	143	0.7	964.4	964.4	964.5	0.1
J	8,566	136	632	0.2	964.9	964.9	965.0	0.1
K	9,445	220	734	0.2	965.5	965.5	965.5	0.0
BLACK CREEK								
A	17,424	259	865	1.9	852.5	852.5	852.5	0.0
B	18,164	176	761	2.1	853.1	853.1	853.1	0.0
C	21,859	132	498	3.3	855.2	855.2	855.3	0.1
D	23,091	189	984	1.7	856.1	856.1	856.2	0.1
E	24,411	400	2088	0.8	856.4	856.4	856.5	0.1
F	25,861	520	1909	0.9	856.6	856.6	856.7	0.1
G	28,081	850	4997	0.3	856.7	856.7	856.8	0.1
H	30,616	449	1591	0.2	857.9	857.9	858.0	0.1
I	33,253	24	105	2.7	863.7	863.7	863.7	0.0
J	34,995	539	1464	0.2	863.9	863.9	863.9	0.0
K	37,371	19	36	7.8	866.1	866.1	866.1	0.0

[1] BIXLER LAKE DITCH - FEET ABOVE MOUTH; BLACK CREEK - FEET ABOVE MOUTH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
BRANCH CREEK								
A	1,360	140	2500	0.2	890.0	890.0	890.2	0.2
B	4,540	260	275	1.4	890.5	890.5	890.7	0.2
C	6,740	160	520	0.7	890.6	890.6	890.8	0.2
D	8,470	310	890	0.4	891.1	891.1	891.3	0.2
E	11,670	335	591	0.6	892.6	892.6	892.8	0.2
F	15,390	400	660	0.6	893.2	893.2	893.4	0.2
G	16,790	120	250	1.4	893.5	893.5	893.7	0.2
CARROL CREEK								
A	750	265	1003	0.3	890.3	890.3	890.5	0.2
B	3,300	133	362	1.0	891.4	891.4	891.6	0.2
C	5,175	222	792	0.5	891.8	891.8	892.0	0.2
D	6,825	120	468	0.9	892.1	892.1	892.3	0.2
E	8,450	250	880	0.2	892.2	892.2	892.4	0.2
F	9,800	180	107	1.2	892.2	892.2	892.4	0.2
G	12,400	160	331	0.4	892.4	892.4	892.6	0.2
H	12,900	46	59	2.0	893.2	893.2	893.4	0.2
I	15,750	**	**	**	895.8	**	**	**
J	18,050	**	**	**	895.9	**	**	**
K	20,630	**	**	**	897.0	**	**	**
L	25,560	**	**	**	898.3	**	**	**
CRANE LAKE DITCH								
A	1,350	**	**	**	901.7	**	**	**
B	3,700	**	**	**	902.0	**	**	**

[1] BRANCH CREEK - FEET ABOVE MOUTH; CARROL CREEK - FEET ABOVE MOUTH; CRANE LAKE DITCH - FEET ABOVE MOUTH

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

** DATA NOT AVAILABLE, FLOODWAY NOT CALCULATED IN THIS STUDY REACH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
CROFT DITCH								
A	1,080	290	1095	0.6	886.4	886.4	886.6	0.2
B	3,000	109	244	2.8	887.1	887.1	887.3	0.2
C	3,680	77 †	251	2.7	888.4	888.4	888.6	0.2
D	5,320	150 †	500	1.3	888.5	888.5	888.7	0.2
E	7,200	220 †	478	1.4	891.3	891.3	891.5	0.2
F	9,100	175 †	545	1.2	896.0	896.0	896.2	0.2
G	11,500	217	326	1.7	900.6	900.6	900.8	0.2
H	13,780	113 †	266	2.0	904.8	904.8	905.0	0.2
I	15,180	141 †	277	1.9	908.9	908.9	909.1	0.2
J	17,300	103	201	2.5	912.9	912.9	913.1	0.2
K	18,420	40	119	4.2	919.2	919.2	919.4	0.2
L	19,780	52	150	3.3	923.9	923.9	924.1	0.2
M	20,540	40	129	3.7	926.3	926.3	926.5	0.2
N	21,940	40	136	3.4	929.5	929.5	929.7	0.2
O	24,800	53	221	2.0	932.2	932.2	932.4	0.2
P	26,300	300	653	0.7	932.8	932.8	933.0	0.2
Q	28,300	200	710	0.6	933.0	933.0	933.2	0.2
R	31,190	**	**	**	933.7	**	**	**
S	33,425	**	**	**	933.7	**	**	**
DIAMOND LAKE DITCH								
A	23.25	175	750	0.1	877.1	877.1	877.3	0.2
B	34.85	150	370	0.2	877.1	877.1	877.3	0.2
C	57.00	**	**	**	877.1	**	**	**
D	96.90	**	**	**	878.1	**	**	**
E	127.50	**	**	**	879.2	**	**	**
F	145.50	**	**	**	879.3	**	**	**
G	160.95	**	**	**	879.3	**	**	**
H	190.50	**	**	**	879.5	**	**	**

[1] CROFT DITCH - FEET ABOVE MOUTH; DIAMOND LAKE DITCH - HUNDREDS OF FEET ABOVE MOUTH

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

** DATA NOT AVAILABLE, FLOODWAY NOT CALCULATED IN THIS STUDY REACH

† FLOODWAY WIDTH MAY DIFFER FROM FIRM. PLEASE SEE FIRM FOR REGULATORY

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
DRY RUN								
A	420	75	400	0.7	890.0	890.0	890.2	0.2
B	1,980	150	208	1.4	895.2	895.2	895.4	0.2
C	3,850	39	108	2.5	900.8	900.8	901.0	0.2
D	6,950	96	94	2.8	916.1	916.1	916.3	0.2
E	8,510	63	124	2.1	919.4	919.4	919.6	0.2
F	9,600	50	177	1.5	923.9	923.9	924.1	0.2
G	12,400	200	1530	0.2	925.3	925.3	925.5	0.2
H	13,940	44	114	1.8	928.4	928.4	928.6	0.2
I	16,900	175	502	0.4	932.2	932.2	932.4	0.2
ELEY DRAIN								
A	0.40	55	183	2.4	911.2	911.2	911.2	0.0
B	0.89	44	87	4.2	927.0	927.0	927.1	0.1
C	1.33	29	72	4.9	941.0	941.0	941.0	0.0
D	1.79	80	191	1.9	959.3	959.3	959.4	0.1

[1] DRY RUN - FEET ABOVE MOUTH; ELEY DRAIN - MILES ABOVE STEWART DRAIN

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
ELKHART RIVER								
A	36.33	440	2167	1.1	857.0	857.0	857.2	0.2
B	37.04	358	1220	2.0	858.5	858.5	858.7	0.2
C	37.58	160	892	2.7	860.5	860.5	860.7	0.2
D	38.04	160	1118	2.1	861.9	861.9	862.1	0.2
E	38.75	291	1885	1.2	862.8	862.8	863.0	0.2
F	39.51	184	908	2.4	864.7	864.7	864.9	0.2
G	39.94	470	1758	1.3	865.7	865.7	865.9	0.2
H	40.53	187	1131	2.0	867.1	867.1	867.3	0.2
I	40.90	149	900	2.5	868.3	868.3	868.5	0.2
J	41.31	171	1096	2.0	869.9	869.9	870.0	0.1
K	41.53	172	1051	2.1	870.4	870.4	870.5	0.1
L	42.15	419	2162	1.0	871.6	871.6	871.7	0.1
M	43.13	310 †	1047	2.0	872.6	872.6	872.8	0.2
N	43.44	437	1791	1.2	873.3	873.3	873.5	0.2
O	43.91	360 †	2067	1.0	873.7	873.7	873.9	0.2
P	44.68	368 †	1700	1.2	874.0	874.0	874.2	0.2
Q	45.17	368	2055	1.0	874.4	874.4	874.6	0.2
R	45.68	210	1245	1.7	875.1	875.1	875.3	0.2
S	45.92	468	2199	1.0	875.8	875.8	876.0	0.2
FORKER CREEK								
A	800	**	**	**	890.1	**	**	**
B	1,860	**	**	**	890.1	**	**	**
C	3,310	**	**	**	891.1	**	**	**
D	4,560	**	**	**	892.9	**	**	**

[1] ELKHART RIVER - MILES ABOVE MOUTH; FORKER CREEK - FEET ABOVE MOUTH

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

** DATA NOT AVAILABLE, FLOODWAY NOT CALCULATED IN THIS STUDY REACH

† FLOODWAY WIDTH MAY DIFFER FROM FIRM. PLEASE SEE FIRM FOR REGULATORY WIDTH.

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
GILBERT LAKE DITCH								
A	11.20	**	**	**	887.1	**	**	**
B	32.00	52	57	0.6	887.6	887.6	887.8	0.2
C	46.30	50	34	0.9	888.5	888.5	888.7	0.2
D	79.00	**	**	**	889.9	**	**	**
HENDERSON LAKE DITCH								
A	0	126	174	1.8	917.1	917.1	917.3	0.2
B	2,080	175	200	1.2	918.4	918.4	918.6	0.2
C	4,200	170	225	1.1	919.7	919.7	919.7	0.2
D	5,560	124	265	0.9	922.7	922.7	922.7	0.2
E	7,360	410	900	0.2	924.2	924.2	924.2	0.2
F	8,680	103	139	1.6	925.6	925.6	925.6	0.2
G	10,240	147	199	1.1	928.4	928.4	928.4	0.2
H	11,700	150	150	1.4	930.9	930.9	931.1	0.2
I	13,620	46	72	2.9	938.2	938.2	938.4	0.2
J	14,510	37	103	2.0	944.0	944.0	944.2	0.2
K	15,390	39	118	1.7	944.7	944.7	944.9	0.2
L	17,990	46	88	2.3	949.3	949.3	949.5	0.2
M	18,470	125	307	0.5	951.4	951.4	951.6	0.2
N	19,490	32	152	0.9	952.7	952.7	952.9	0.2
O	20,540	40	180	0.8	953.9	953.9	954.0	0.1
P	21,290	33	111	1.2	954.3	954.3	954.4	0.1
Q	21,790	45	83	1.6	954.9	954.9	955.0	0.1
R	22,090	50	157	0.9	955.0	955.0	955.1	0.1
S	22,490	123	259	0.5	955.1	955.1	955.2	0.1
T	24,330	**	**	**	955.2	**	**	**
U	25,050	**	**	**	955.2	**	**	**
V	25,290	**	**	**	955.3	**	**	**

[1] GILBERT LAKE DITCH - HUNDREDS OF FEET ABOVE MOUTH; HENDERSON LAKE DITCH - FEET ABOVE MOUTH

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

** DATA NOT AVAILABLE, FLOODWAY NOT CALCULATED IN THIS STUDY REACH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
HUSTON DITCH								
A	34.20	45	177	1.6	889.9	889.9	890.1	0.2
B	63.70	113	346	0.7	891.7	891.7	891.9	0.2
C	86.90	109	248	1.0	893.4	893.4	893.6	0.2
D	104.70	114	264	0.9	895.7	895.7	895.9	0.2
E	123.10	300	1071	0.2	899.1	899.1	899.3	0.2
F	142.90	102	250	0.9	899.7	899.7	899.9	0.2
G	177.30	125	404	0.5	910.7	910.7	910.9	0.2
H	196.70	50	101	2.0	916.0	916.0	916.2	0.2
LASH DITCH								
A	1,188	32	79	4.9	967.3	967.3	967.3	0.0
B	1,600	306	426	0.7	967.9	967.9	967.9	0.0
C	2,329	146	524	0.5	969.7	969.7	969.8	0.1
D	3,180	67	138	2.0	970.8	970.8	970.8	0.0
E	4,298	19	44	4.8	972.3	972.3	972.4	0.1
F	4,807	143	534	0.7	979.4	979.4	979.4	0.0
LITTLE CEDAR CREEK								
A	36,624	295	1191	2.3	858.5	858.5	858.6	0.1
B	37,924	610	2352	1.1	859.2	859.2	859.2	0.0
C	39,924	600	2121	1.3	859.8	859.8	859.8	0.0
D	42,204	313	2645	0.9	860.7	860.7	860.7	0.0
E	43,416	500	2873	0.8	866.4	866.4	866.4	0.0
F	46,616	482	2177	0.9	867.0	867.0	867.0	0.0

[1] HUSTON DITCH - HUNDREDS OF FEET ABOVE MOUTH; LASH DITCH - FEET ABOVE MOUTH; LITTLE CEDAR CREEK - FEET ABOVE MOUTH

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

TABLE 14

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN
AND INCORPORATED AREAS

FLOODWAY DATA

HUSTON DITCH - LASH DITCH - LITTLE CEDAR CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
LITTLE ELKHART CREEK								
A	590	**	**	**	938.6	**	**	**
B	1,160	**	**	**	938.6	**	**	**
C	4,880	360 [3]	860	0.3	942.8	942.8	943.0	0.2
D	7,740	750	2075	0.1	942.8	942.8	943.0	0.2
E	9,780	**	**	**	942.8	**	**	**
F	11,050	962	3595	0.1	942.8	942.8	943.0	0.2
G	14,200	555	1525	0.1	942.9	942.9	943.1	0.2
H	16,480	127	296	0.6	944.4	944.4	944.6	0.2
I	18,480	325	960	0.2	944.4	944.4	944.6	0.2
J	19,630	113	259	0.7	945.2	945.2	945.4	0.2
K	20,770	169	400	0.4	945.6	945.6	945.8	0.2
L	21,670	350	865	0.2	945.6	945.6	945.8	0.2
M	22,500	**	**	**	948.3	**	**	**
N	23,250	**	**	**	948.3	**	**	**
O	23,910	**	**	**	948.3	**	**	**
P	27,400	**	**	**	949.2	**	**	**
Q	29,400	**	**	**	952.9	**	**	**
R	31,625	**	**	**	959.1	**	**	**
S	33,140	**	**	**	959.1	**	**	**
LONG LAKE DITCH								
A	700	234	792	0.1	880.9	880.9	881.1	0.2
B	3,100	112	108	0.8	881.9	881.9	882.1	0.2
C	5,610	201	363	0.2	882.5	882.5	882.7	0.2
D	7,260	39	83	1.0	885.4	885.4	885.6	0.2
E	9,480	121	95	0.8	887.1	887.1	887.3	0.2
F	10,650	62	39	2.0	889.9	889.9	890.1	0.2
G	11,800	38	56	1.4	891.3	891.3	891.5	0.2
H	14,690	**	**	**	891.5	**	**	**
I	15,725	**	**	**	891.5	**	**	**
J	17,825	**	**	**	892.5	**	**	**
K	18,795	**	**	**	893.1	**	**	**
L	19,745	**	**	**	893.2	**	**	**

[1] LITTLE ELKHART CREEK -FEET ABOVE NOBLE COUNTY LINE; LONG LAKE DITCH - FEET ABOVE MOUTH

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

[3] THIS WIDTH EXTENDS BEYOND COUNTY BOUNDRY

** DATA NOT AVAILABLE, FLOODWAY NOT CALCULATED IN THIS STUDY REACH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
NORTH BRANCH ELKHART RIVER								
A	28.40	1048	3955	0.3	876.2	876.2	876.4	0.2
B	70.40	623	1607	0.7	877.7	877.7	877.9	0.2
C	120.40	999	1772	0.7	878.4	878.4	878.6	0.2
D	147.60	465	1127	1.0	879.9	879.9	880.1	0.2
E	181.20	867	2548	0.4	880.1	880.1	880.3	0.2
F	208.20	1089	1102	1.0	883.1	883.1	883.3	0.2
G	234.30	530	1186	0.9	884.7	884.7	884.9	0.2
H	274.90	463	1165	0.9	886.7	886.7	886.9	0.2
I	303.10	178	661	1.6	888.1	888.1	888.3	0.2
J	323.10	260	1324	0.8	889.1	889.1	889.3	0.2
K	341.90	341	1438	0.7	889.3	889.3	889.5	0.2
L	361.90	420	1322	0.8	889.6	889.6	889.8	0.2
M	385.10	224	1344	0.8	889.7	889.7	889.9	0.2
N	409.90	937	4398	0.3	889.8	889.8	890.0	0.2
O	440.30	1340	5729	0.2	889.8	889.8	890.0	0.2
P	463.80	325	1280	0.8	889.8	889.8	890.0	0.2
Q	485.30	340	1450	0.7	890.0	890.0	890.2	0.2
R	511.00	**	**	**	890.0	**	**	**
S	549.00	**	**	**	890.0	**	**	**
T	609.50	**	**	**	890.0	**	**	**
U	626.00	**	**	**	890.0	**	**	**
V	648.20	**	**	**	890.0	**	**	**
W	678.20	**	**	**	890.0	**	**	**
X	704.50	275	640	0.9	890.4	890.4	890.6	0.2
Y	739.50	566	1071	0.5	891.3	891.3	891.5	0.2
Z	770.30	400	550	1.0	893.2	893.2	893.4	0.2
AA	793.10	125	1000	0.6	893.2	893.2	893.4	0.2

[1] HUNDREDS OF FEET ABOVE MOUTH

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

** DATA NOT AVAILABLE, FLOODWAY NOT CALCULATED IN THIS STUDY REACH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
RIMMEL DITCH								
A	1,150	300	400	2.0	934.5	934.5	934.7	0.2
B	2,790	280	401	1.9	940.2	940.2	940.4	0.2
C	5,025	242	419	1.7	944.5	944.5	944.7	0.2
D	6,965	200	200	3.7	947.5	947.5	947.7	0.2
E	8,485	222	453	1.6	949.0	949.0	949.2	0.2
F	9,345	175	514	1.3	951.8	951.8	952.0	0.2
G	11,400	190	598	1.1	954.0	954.0	854.2	0.2
H	13,580	246	657	1.0	956.3	956.3	956.5	0.2
I	14,780	172	531	1.2	956.8	956.8	957.0	0.2
J	15,080	146	500	1.3	958.5	958.5	958.7	0.2
K	16,820	200	1728	0.4	961.4	961.4	961.6	0.2
L	19,800	175	900	0.5	961.4	961.4	961.6	0.2
M	20,820	175	965	0.5	961.4	961.4	961.6	0.2
N	23,300	100	180	0.8	962.2	962.2	962.4	0.2
O	24,980	100	215	0.6	962.8	962.8	962.8	0.2

[1] FEET ABOVE MOUTH

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
SOLOMON CREEK								
A	45,800	190	451	1.2	867.9	867.9	868.1	0.2
B	47,200	163	329	1.6	870.0	870.0	870.2	0.2
C	50,025	86	244	2.1	874.3	874.3	874.5	0.2
D	52,300	180	814	0.6	877.3	877.3	877.5	0.2
E	54,200	393	852	0.6	877.6	877.6	877.8	0.2
F	55,500	320	760	0.6	877.8	877.8	878.0	0.2
G	57,050	227	452	0.9	878.9	878.9	879.1	0.2
H	58,900	160	430	1.0	879.0	879.0	879.2	0.2
I	60,950	200	196	2.1	881.1	881.1	81.3	0.2
J	63,875	108	246	1.6	885.2	885.2	885.4	0.2
K	65,975	168	242	1.6	886.3	886.3	886.5	0.2
L	68,125	120	250	1.4	887.3	887.3	887.5	0.2
M	70,425	120	370	0.9	888.5	888.5	888.7	0.2
N	73,525	180	450	0.7	890.7	890.7	890.9	0.2
O	75,225	220	292	1.1	891.7	891.7	891.9	0.2
P	77,075	92	204	1.6	893.4	893.4	893.6	0.2
Q	79,075	84	184	1.5	894.9	894.9	895.1	0.2
R	81,375	58	199	1.3	896.2	896.2	896.4	0.2
S	83,700	120	240	1.0	897.4	897.4	897.6	0.2
T	85,400	**	**	**	897.8	**	**	**
U	86,500	80	332	0.3	897.8	897.8	898.0	0.2
V	90,000	80	253	0.4	897.8	897.8	898.0	0.2
W	92,600	80	111	0.6	899.0	899.0	899.2	0.2

[1] FEET ABOVE MOUTH

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

** DATA NOT AVAILABLE, FLOODWAY NOT CALCULATED IN THIS STUDY REACH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
SOUTH BRANCH ELKHART RIVER								
A	3,080	600 †	1400	0.6	876.3	876.3	876.5	0.2
B	5,240	180 †	730	1.2	876.8	876.8	877.0	0.2
C	8,920	1163 †	3058	0.3	877.0	877.0	877.2	0.2
D	14,160	1825	11450	0.1	877.0	877.0	877.2	0.2
E	18,320	1300	3400	0.2	877.0	877.0	877.2	0.2
F	23,160	1600	5400	0.2	877.2	877.2	877.4	0.2
G	25,680	300	1650	0.6	877.3	877.3	877.5	0.2
H	28,520	950	3110	0.3	877.3	877.3	877.5	0.2
I	33,840	2100	7818	0.1	877.4	877.4	877.6	0.2
J	42,040	877	1357	0.8	879.4	879.4	879.6	0.2
K	45,480	500	1500	0.7	879.5	879.5	879.7	0.2
L	46,520	400	1200	0.9	880.1	880.1	880.3	0.2
M	49,880	500	1950	0.5	880.2	880.2	880.4	0.2
N	51,950	584	2350	0.5	880.8	880.8	881.0	0.2
O	56,910	1050	5269	0.2	880.9	880.9	881.1	0.2
P	61,510	950	3550	0.3	881.0	881.0	881.2	0.2
Q	64,590	500	1910	0.6	881.2	881.2	881.4	0.2
R	70,270	719	2331	0.5	882.1	882.1	882.3	0.2
S	73,150	600	2451	0.4	882.7	882.7	882.9	0.2
T	74,990	172	708	1.5	884.9	884.9	885.1	0.2
U	76,870	288	1337	0.8	885.4	885.4	885.6	0.2
V	78,060	400	1250	0.9	886.3	886.3	886.5	0.2
W	80,300	550	1640	0.7	886.4	886.4	886.6	0.2
X	82,340	155	548	0.9	887.3	887.3	887.5	0.2
Y	84,660	45	291	0.8	888.2	888.2	888.4	0.2
Z	86,700	87	494	0.9	888.5	888.5	888.7	0.2
AA	87,910	150	625	0.7	888.7	888.7	888.9	0.2
AB	89,070	103	569	0.8	888.8	888.8	889.0	0.2
AC	89,800	**	**	**	888.9	**	**	**
AD	91,450	**	**	**	888.9	**	**	**
AE	94,700	**	**	**	889.0	**	**	**
AF	97,400	**	**	**	889.4	**	**	**

[1] FEET ABOVE MOUTH

† FLOODWAY WIDTH MAY DIFFER FROM FIRM. PLEASE SEE FIRM FOR REGULATORY WIDTH.

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

** DATA NOT AVAILABLE, FLOODWAY NOT CALCULATED IN THIS STUDY REACH

TABLE 14

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN
AND INCORPORATED AREAS

FLOODWAY DATA

SOUTH BRANCH ELKHART RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
SOUTH BRANCH ELKHART RIVER								
AG	100,100	**	**	**	890.1	**	**	**
AH	101,700	**	**	**	890.1	**	**	**
AI	103,200	**	**	**	890.1	**	**	**
AJ	104,500	**	**	**	890.3	**	**	**
SPARTA LAKE DITCH								
A	920	450 [3]	1050	0.1	871.7	871.7	871.9	0.2
B	1,700	500 [3†]	1350	0.1	871.8	871.8	872.0	0.2
C	3,060	400	980	0.1	871.8	871.8	872.0	0.2
D	5,140	400	1440	0.1	872.2	872.2	872.4	0.2
E	7,180	16 [†]	40	1.8	877.0	877.0	877.2	0.2
F	9,390	172	137	0.5	879.3	879.3	879.5	0.2
G	12,350	**	**	**	879.3	**	**	**
H	14,390	**	**	**	880.1	**	**	**
I	15,990	200	145	0.4	882.2	882.2	882.4	0.2
J	17,630	181	442	0.1	884.6	884.6	884.8	0.2
K	20,430	100	200	0.2	886.0	886.0	886.2	0.2
L	22,870	66	88	0.4	886.4	886.4	886.6	0.2
M	24,870	100	85	0.4	887.9	887.9	888.1	0.2
N	26,080	100	49	0.5	888.1	888.1	888.3	0.2
SYCAMORE CREEK								
A	2.00	350	605	0.8	910.1	910.1	910.3	0.2
B	31.20	172	295	1.6	918.1	918.1	918.3	0.2
C	42.80	289	1218	0.4	923.3	923.3	923.5	0.2
D	80.80	110	327	1.4	929.7	929.7	929.9	0.2
E	115.40	131	288	1.5	940.8	940.8	941.0	0.2
F	132.65	191	332	1.3	943.7	943.7	943.9	0.2
G	155.65	84	242	1.6	949.3	949.3	949.5	0.2
H	172.50	47	153	2.4	955.2	955.2	955.4	0.2
I	188.00	37	173	2.1	960.0	960.0	960.2	0.2
J	206.30	38	150	2.3	966.8	966.8	967.0	0.2

[1] SOUTH BRANCH ELKHART RIVER - FEET ABOVE MOUTH; SPARTA LAKE DITCH - FEET ABOVE MOUTH; SYCAMORE CREEK - HUNDREDS OF FEET ABOVE COUNTY BOUNDARY

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

[3] THIS WIDTH EXTENDS BEYOND THE COUNTY BOUNDRY

[†] FLOODWAY WIDTH MAY DIFFER FROM FIRM. PLEASE SEE FIRM FOR REGULATORY

** DATA NOT AVAILABLE, FLOODWAY NOT CALCULATED IN THIS STUDY REACH

TABLE 14

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN
AND INCORPORATED AREAS

FLOODWAY DATA

SOUTH BRANCH ELKHART RIVER - SPARTA LAKE DITCH - SYCAMORE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
TIPPECANOE RIVER								
A	3,180	242	444	0.8	858.3	858.3	858.5	0.2
B	5,100	129	272	1.4	863.1	863.1	863.3	0.2
C	6,980	445	2462	0.2	880.7	880.7	880.9	0.2
D	9,980	125	266	1.4	881.0	881.0	881.2	0.2
E	11,390	105	309	1.2	881.3	881.3	881.5	0.2
F	14,260	150	400	0.9	881.9	881.9	882.1	0.2
G	16,220	**	**	**	882.2	**	**	**
H	17,070	**	**	**	882.3	**	**	**
I	18,020	125	250	1.3	882.3	882.3	882.5	0.2
J	21,470	125	123	2.4	883.7	883.7	883.9	0.2
K	23,140	36	99	3.0	886.1	886.1	886.3	0.2
L	25,250	**	**	**	887.1	**	**	**
M	28,125	**	**	**	887.1	**	**	**
N	29,970	24	24	2.1	888.4	888.4	888.6	0.2
O	32,170	100	100	1.0	888.8	888.8	889.0	0.2
P	34,020	53	53	1.8	890.1	890.1	890.3	0.2
Q	34,865	46	46	2.0	890.9	890.9	891.1	0.2
R	37,305	53	53	1.7	892.7	892.7	892.9	0.2
S	39,860	49	49	1.6	894.8	894.8	895.0	0.2
T	45,450	100	100	0.9	897.2	897.2	897.4	0.2
U	47,520	24	24	1.7	899.2	899.2	899.4	0.2
V	50,160	36	36	1.1	900.8	900.8	901.0	0.2
W	53,240	229	229	0.1	901.1	901.1	901.3	0.2
X	54,450	**	**	**	901.5	**	**	**
Y	59,050	**	**	**	901.5	**	**	**
Z	62,040	**	**	**	906.5	**	**	**
AA	63,150	**	**	**	906.5	**	**	**
TURKEY CREEK								
A	2,080	196	539	0.3	870.3	870.3	870.5	0.2
B	4,280	81	230	0.7	875.0	875.0	875.2	0.2
C	5,580	178	307	0.6	875.5	875.5	875.7	0.2

[1] TIPPECANOE RIVER -FEET ABOVE THE BACKWATERS OF WEBSTER LAKE; TURKEY CREEK - FEET ABOVE MOUTH

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

** DATA NOT AVAILABLE, FLOODWAY NOT CALCULATED FOR THIS STUDY REACH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
TURKEY CREEK								
D	8,025	**	**	**	879.2	**	**	**
E	9,825	**	**	**	879.2	**	**	**
F	12,150	**	**	**	879.6	**	**	**
G	13,650	**	**	**	879.9	**	**	**
H	15,750	**	**	**	880.2	**	**	**
I	18,150	**	**	**	880.6	**	**	**
J	20,650	**	**	**	880.7	**	**	**
K	22,140	**	**	**	880.7	**	**	**
VAN GORDER DRAIN								
A	0.69	25	79	5.4	903.4	903.4	903.4	0.0
B	1.08	21	72	5.9	912.7	912.7	912.7	0.0
C	1.44	52	289	1.5	923.9	923.9	923.9	0.0
D	1.92	47	308	4.7	931.3	931.3	931.4	0.1
E	2.36	12	27	1.9	933.4	933.4	933.5	0.1
WATERHOUSE DITCH								
A	6.90	47	167	0.6	951.5	951.5	951.7	0.2
B	23.70	48	102	0.9	951.8	951.8	952.0	0.2
C	45.50	42 †	87	1.0	953.1	953.1	953.3	0.2
D	72.70	40 †	150	0.6	953.9	953.9	954.1	0.2
E	87.00	**	**	**	954.3	**	**	**
F	110.50	**	**	**	954.3	**	**	**
G	131.70	**	**	**	954.3	**	**	**
H	143.50	**	**	**	954.3	**	**	**
I	175.60	**	**	**	954.3	**	**	**

[1] TURKEY CREEK - FEET ABOVE MOUTH; VAN GORDER DRAIN - MILES ABOVE BASE LINE ROAD; WATERHOUSE DITCH - HUNDREDS OF FEET ABOVE MOUTH

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

** DATA NOT AVAILABLE, FLOODWAY NOT CALCULATED IN THIS STUDY REACH

† FLOODWAY WIDTH MAY DIFFER FROM FIRM. PLEASE SEE FIRM FOR REGULATORY WIDTH.

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE [2] (FEET)
WILLOW CREEK								
A	1,250	37	154	3.9	847.5	847.5	847.5	0.0
B	4,625	136	399	1.5	850.8	850.8	850.9	0.1
C	5,925	170	399	1.5	851.7	851.7	851.8	0.1
D	8,111	47	211	2.8	854.1	854.1	854.2	0.1
E	8,906	88	572	1.0	862.5	862.5	862.5	0.0
F	12,346	790	5588	0.1	862.6	862.6	862.6	0.0
G	15,680	55	210	2.3	865.1	865.1	865.3	0.2
H	17,360	300	1918	0.2	868.8	868.8	869.0	0.2
I	20,760	53	274	1.4	870.5	870.5	870.7	0.2
WINEBRENNER BRANCH								
A	200	200	780	0.3	892.2	892.2	892.4	0.2
B	1,600	226	159	1.6	893.1	893.1	893.3	0.2
C	2,500	250	340	0.8	893.2	893.2	893.4	0.2
D	3,730	40	126	2.0	897.2	897.2	897.4	0.2
E	5,290	25	150	1.7	898.0	898.0	898.2	0.2
F	7,720	150	220	1.1	898.6	898.6	898.8	0.2
G	10,060	100	150	1.5	898.7	898.7	898.9	0.2
H	12,260	20	104	1.4	900.8	900.8	901.0	0.2

[1] WILLOW CREEK - FEET ABOVE COUNTY BOUNDARY; WINEBRENNER BRANCH - FEET ABOVE CONFLUENCE WITH CARROL CREEK

[2] SURCHARGE GREATER THAN 0.14 FOR PRECOUNTY-WIDE STUDIES APPROVED BY NRC OF IDNR

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or base flood depths are shown within this zone.

Zone AE

Zone AE is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, and areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or base flood depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance risk zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The current FIRM presents flooding information for the entire geographic area of Noble County. Previously, separate FIRMs were prepared for each identified flood prone incorporated community and for the unincorporated areas of the county. Historical data relating to the maps prepared for each community are presented in Table 15.

7.0 OTHER STUDIES

This FIS report either supersedes or is compatible with all previous studies on streams studied in this report and should be considered authoritative for purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Flood Insurance and Mitigation Division, Federal Emergency Management Agency, Region V, 536 S. Clark Street, 6th Floor, Chicago, IL 60605.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Albion, Town of	TBD	None	TBD	None
Avilla, Town of	TBD	None	TBD	None
*Cromwell, Town of	N/A	None	N/A	None
Kendallville, City of	June 14, 1974	December 26, 1975 September 10, 1976	January 6, 1983	None
Ligonier, City of	July 16, 1976	None	January 6, 1983	None
Noble County (Unincorporated Areas)	August 15, 1978	None	January 3, 1979	None
Rome City, Town of	July 11, 1975	September 1, 1978	October 15, 1982	None
*Wolcottville, Town of	N/A	None	N/A	None

*No Special Flood Hazard Area Identified

TABLE 15

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

9.0 BIBLIORAPHY AND REFERENCES

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2. Federal Emergency Management Agency, Flood Insurance Study, City of Kendallville, Indiana, July 6, 1982.
3. Federal Emergency Management Agency, Flood Insurance Study, City of Ligonier, Indiana, July 6, 1982.
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CONFLUENCE AT HENDERSON LAKE
PRIVATE DRIVE
PRIVATE DRIVE
GOLF CART CROSSING
GOLF CART CROSSING
GOLF CART CROSSING
GOLF CART CROSSING
WALKING BRIDGE
GOLF CART CROSSING
GOLF CART CROSSING
WESTON AVE
WALKING BRIDGE
LINCOLN ST
ORCHARD ST
RAILROAD
MAIN ST
RAILROAD

980
975
970
965
960
955
950
945
940
935

ELEVATION IN FEET (NAVD 88)

0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500

STREAM DISTANCE IN FEET ABOVE MOUTH

A
B
C
D
E
F
G

LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION

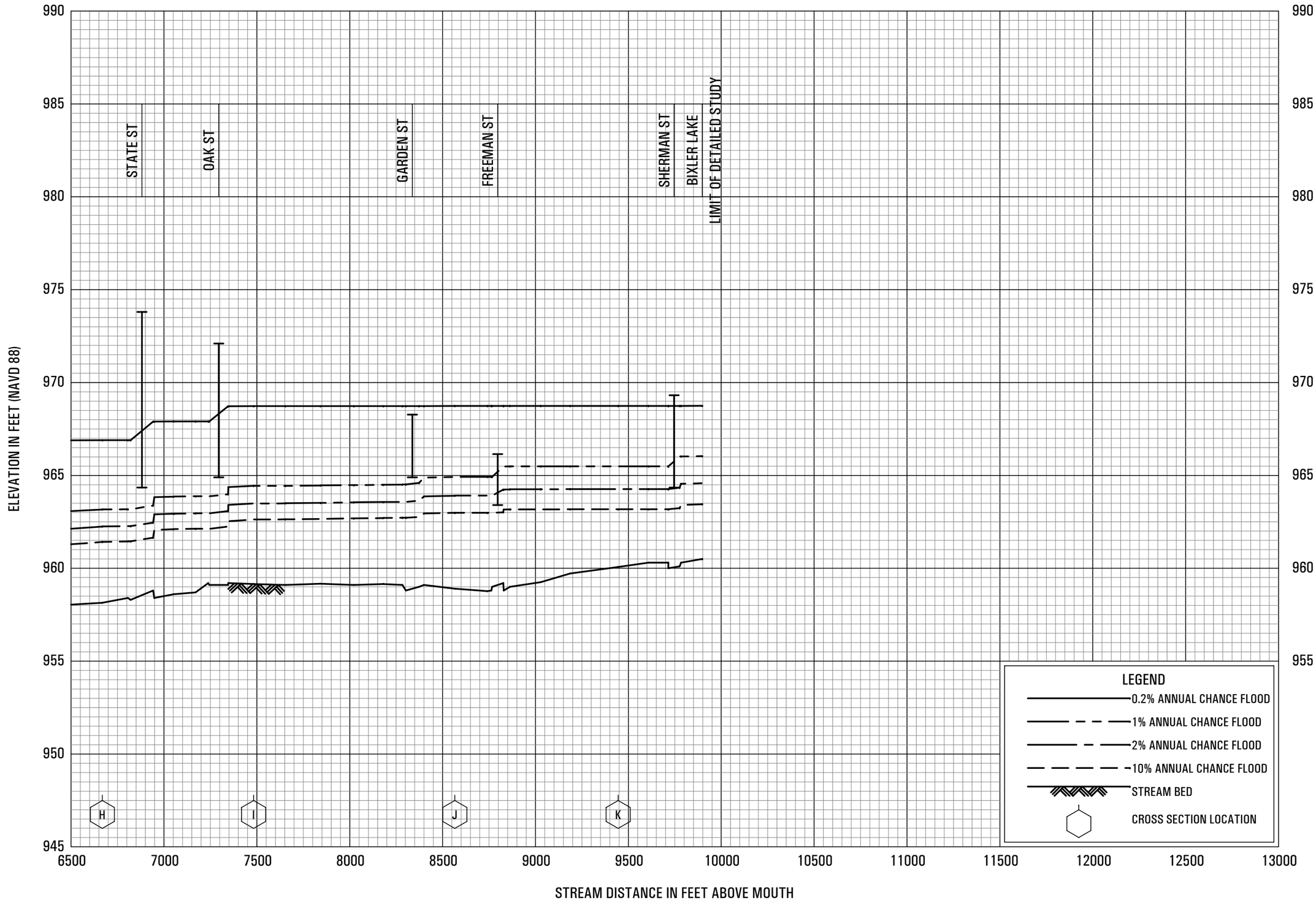
FLOOD PROFILES

BIXLER LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN
AND INCORPORATED AREAS

01P



FLOOD PROFILES

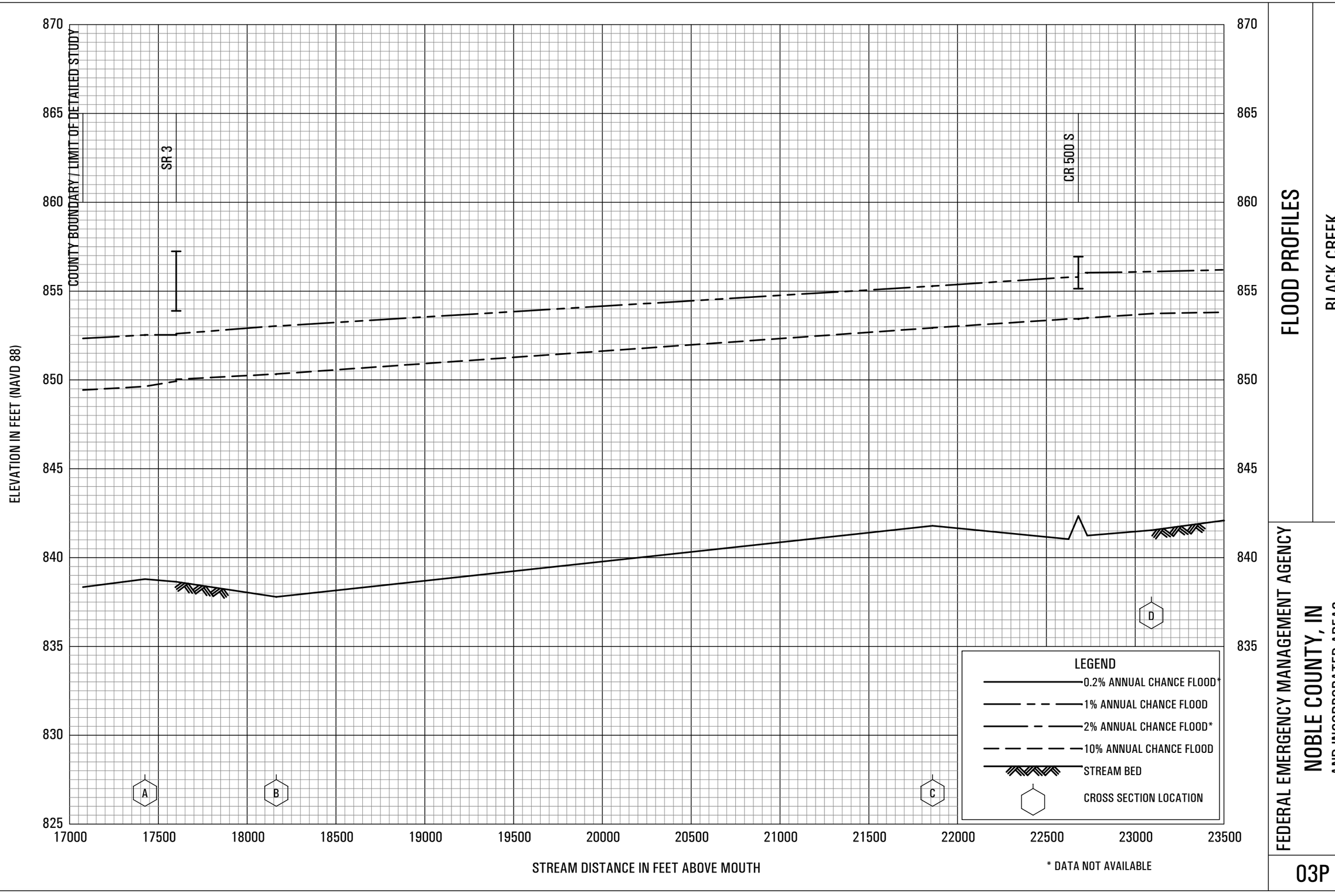
BIXLER LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

02P



FLOOD PROFILES

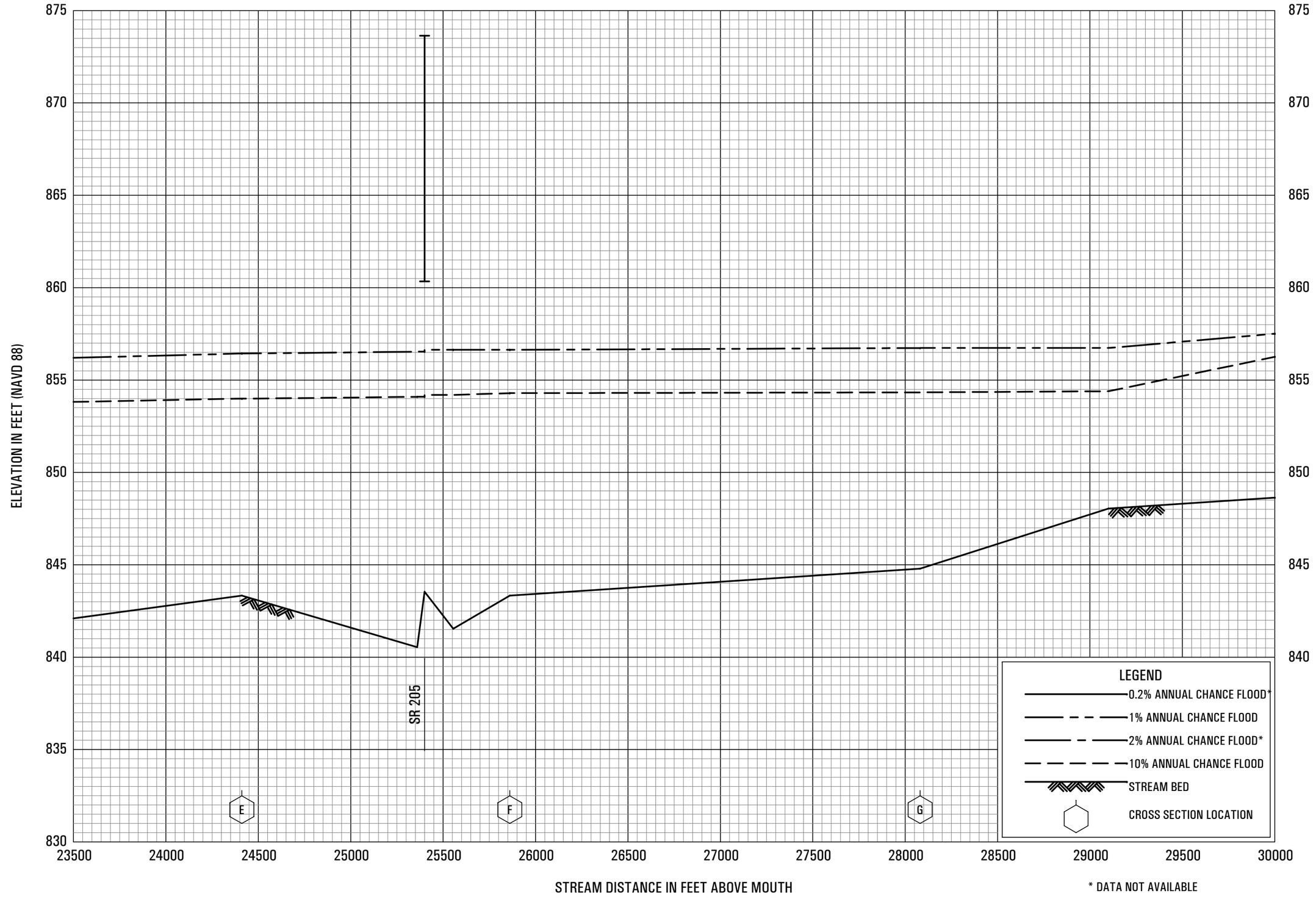
BLACK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

03P



* DATA NOT AVAILABLE

FLOOD PROFILES

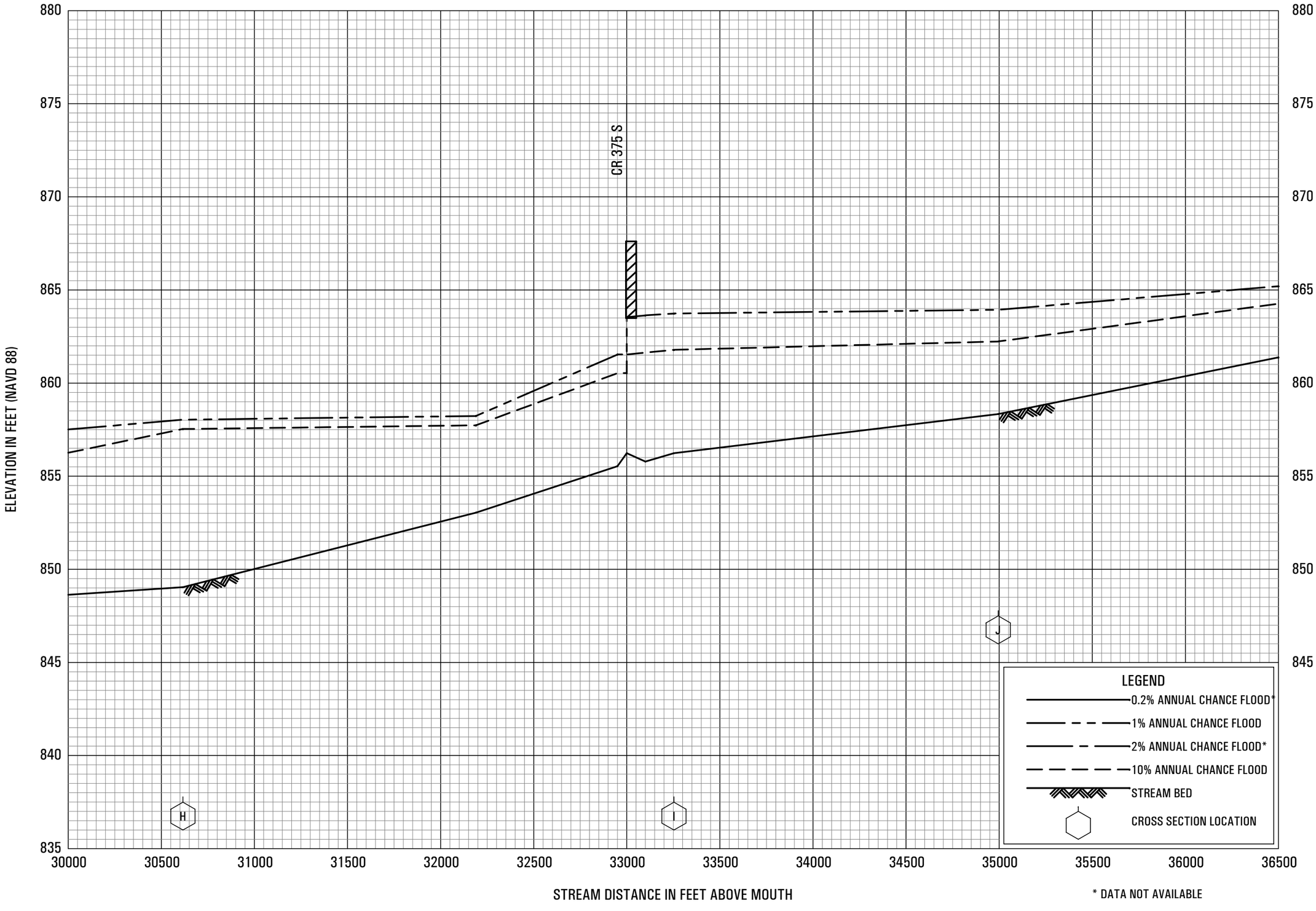
BLACK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

04P



FLOOD PROFILES

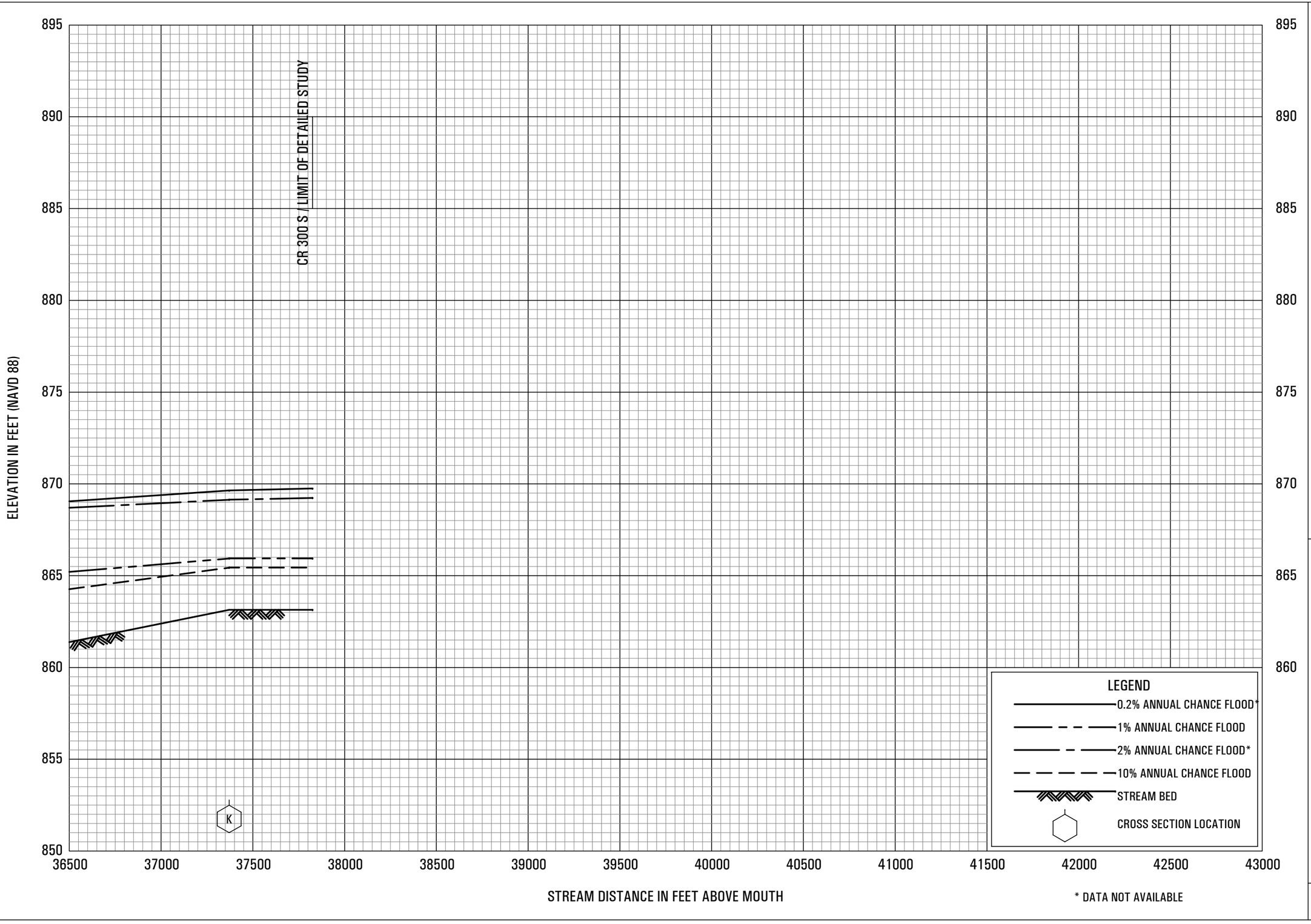
BLACK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

05P



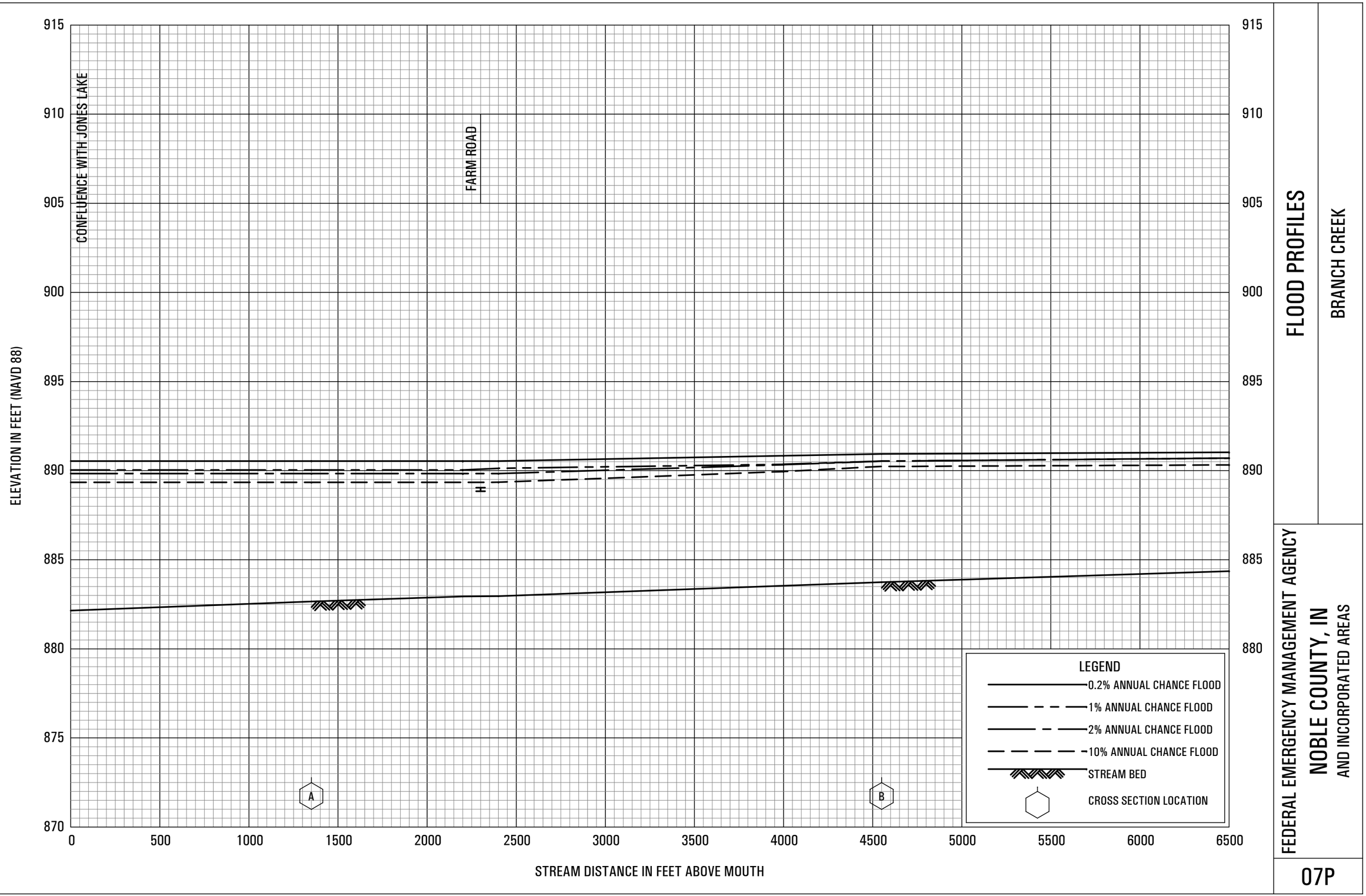
FLOOD PROFILES

BLACK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN
AND INCORPORATED AREAS

06P



FLOOD PROFILES

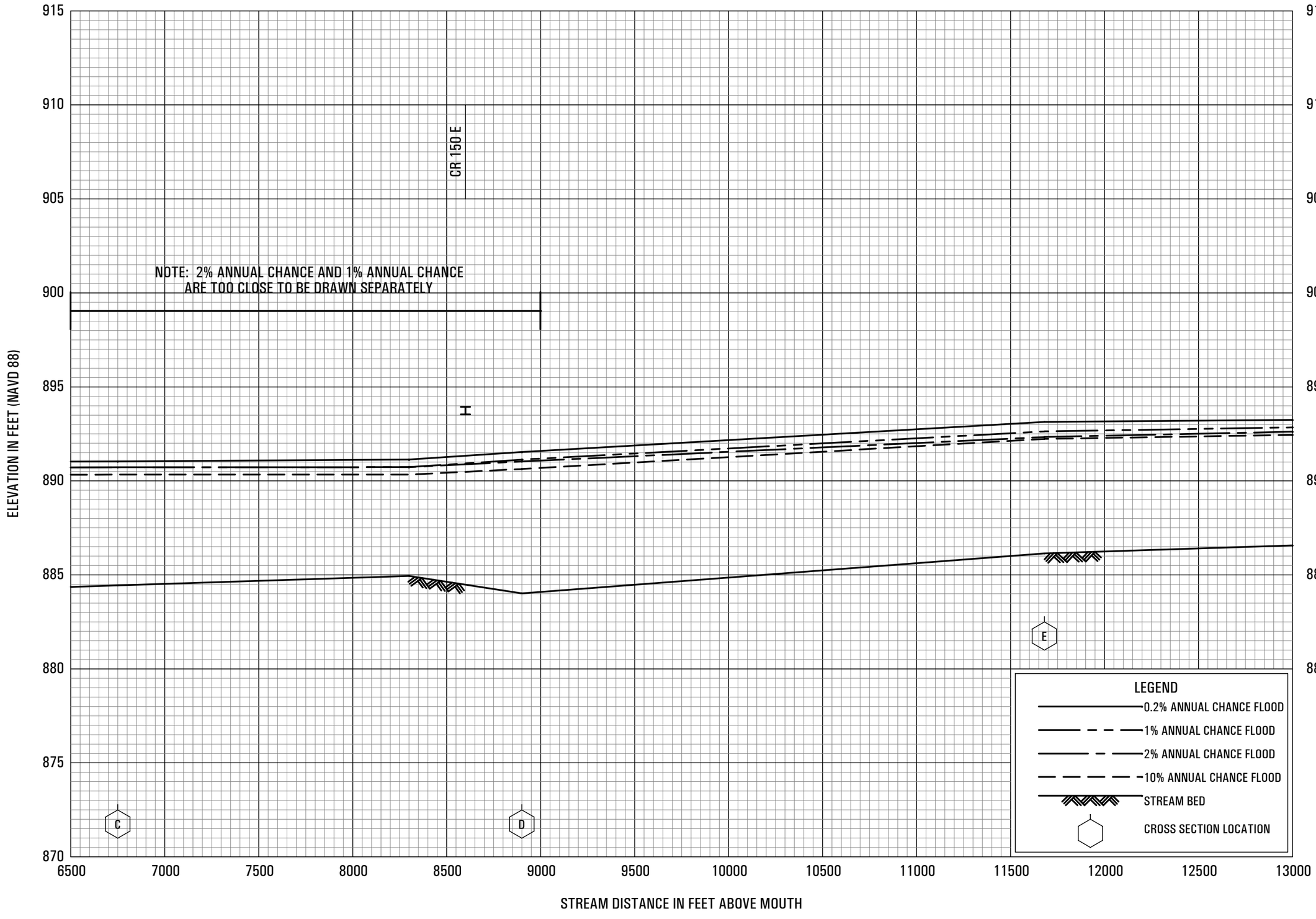
BRANCH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

07P



FLOOD PROFILES

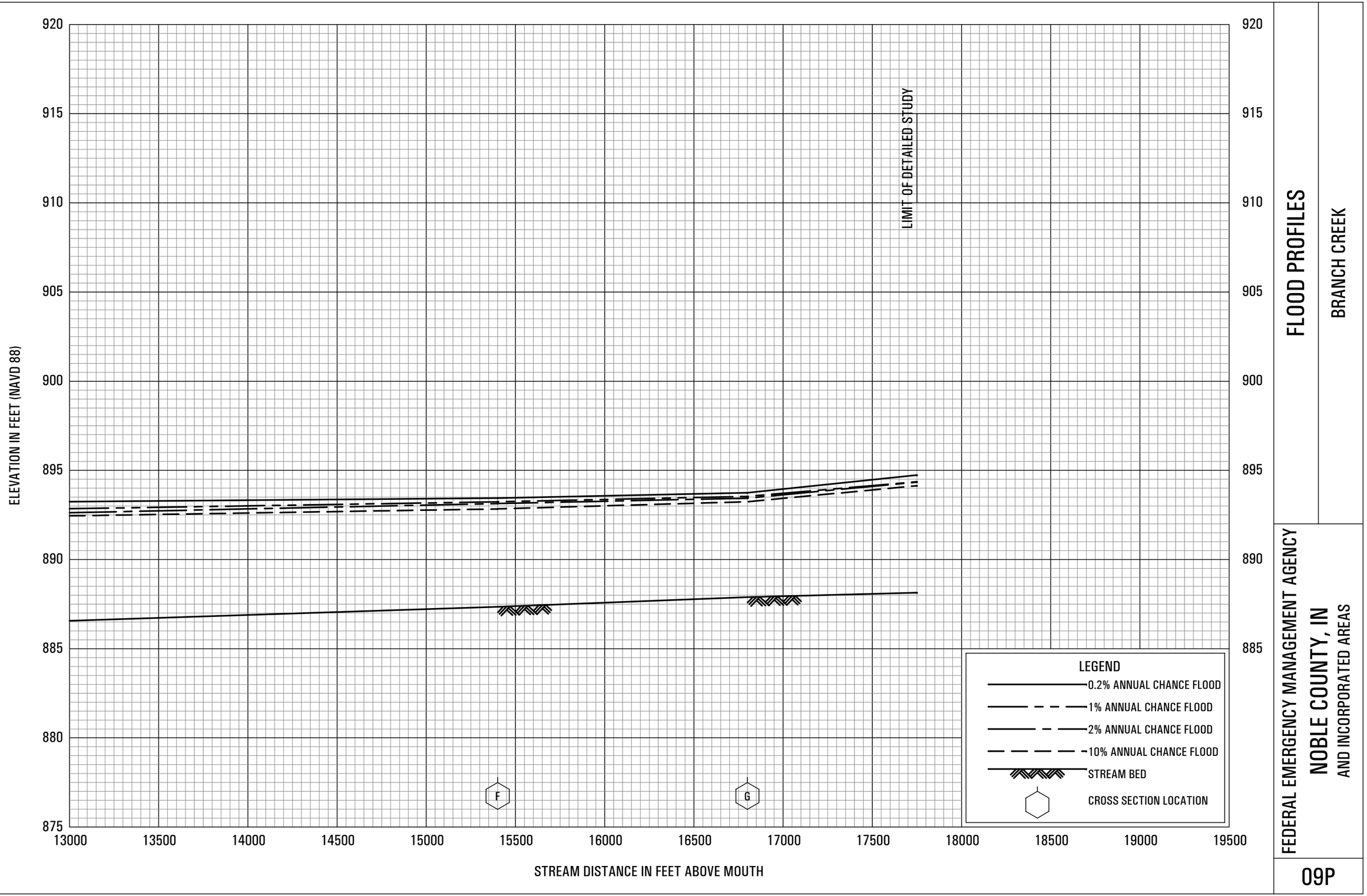
BRANCH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

08P



FLOOD PROFILES

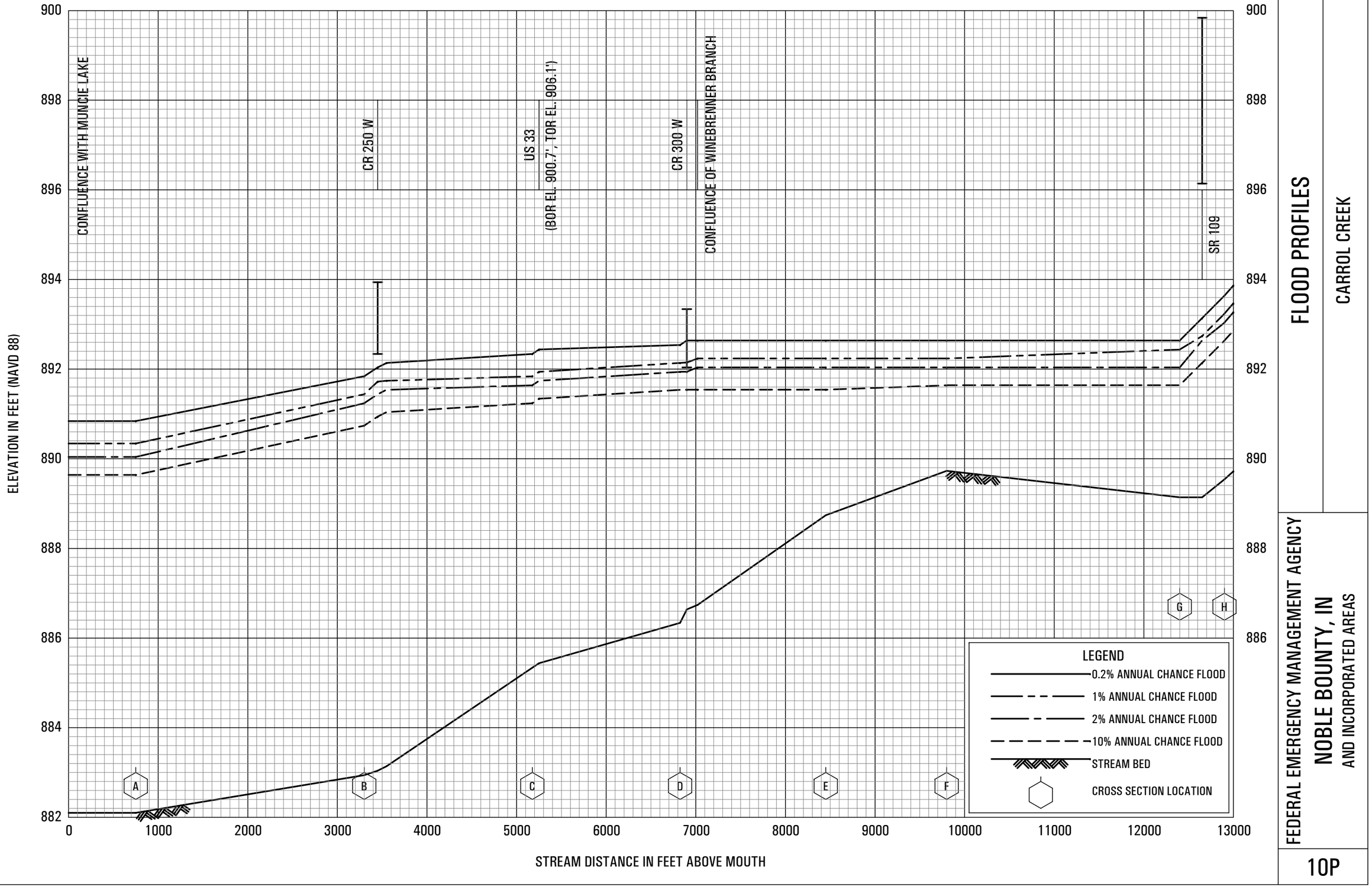
BRANCH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

09P



FLOOD PROFILES

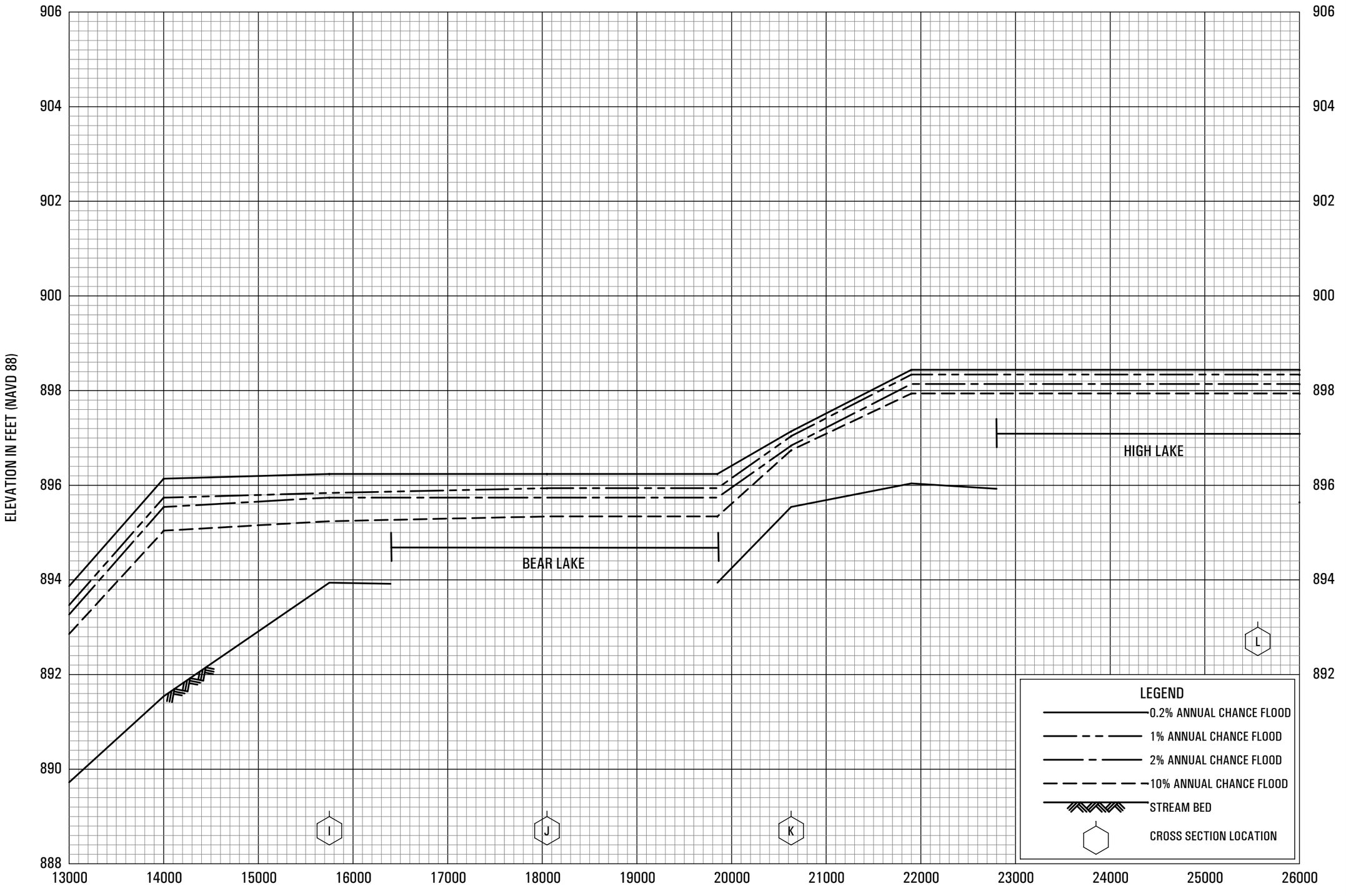
CARROL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE BOUNTY, IN

AND INCORPORATED AREAS

10P



FLOOD PROFILES

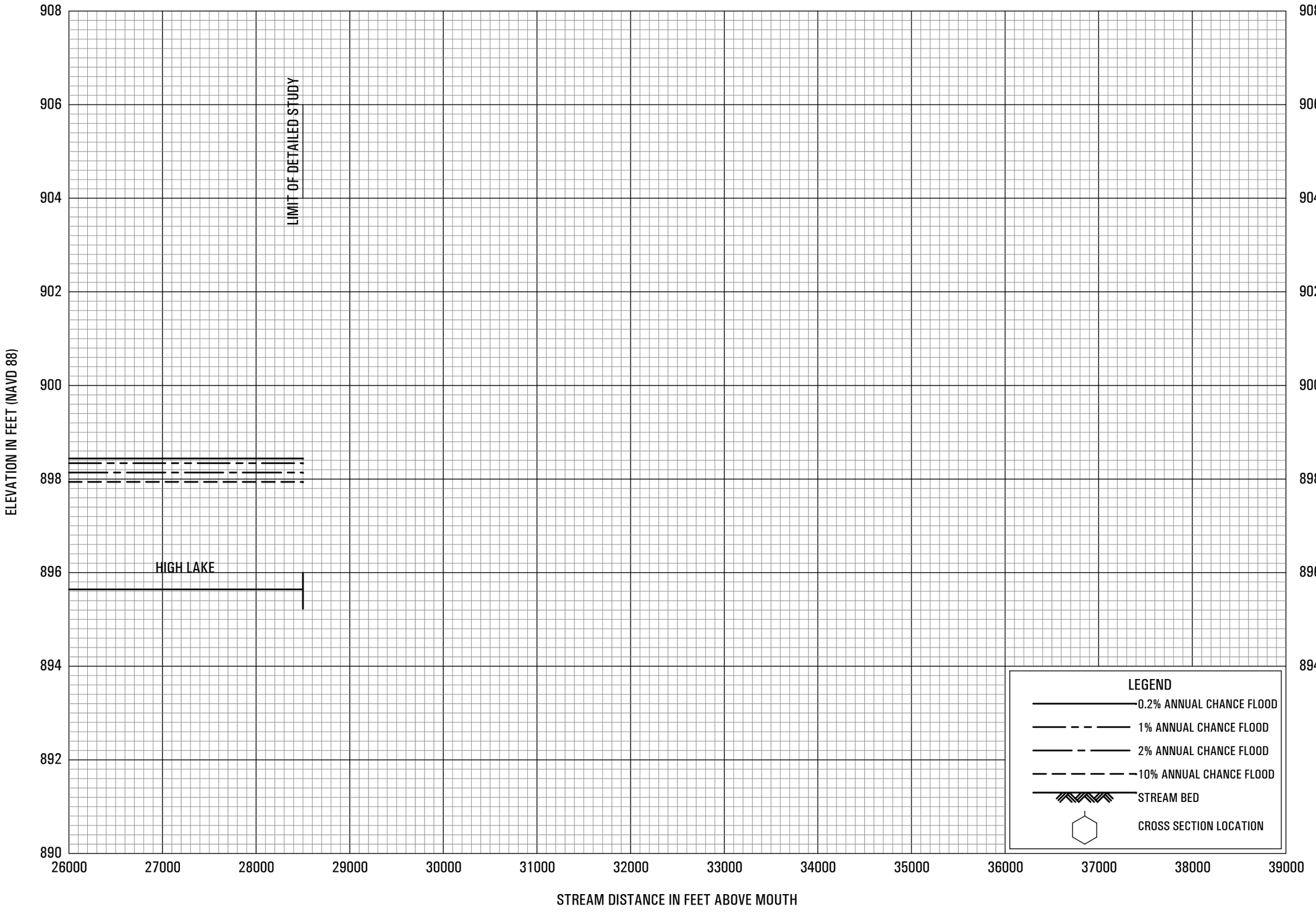
CARROL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE BOUNTY, IN

AND INCORPORATED AREAS

11P



FLOOD PROFILES

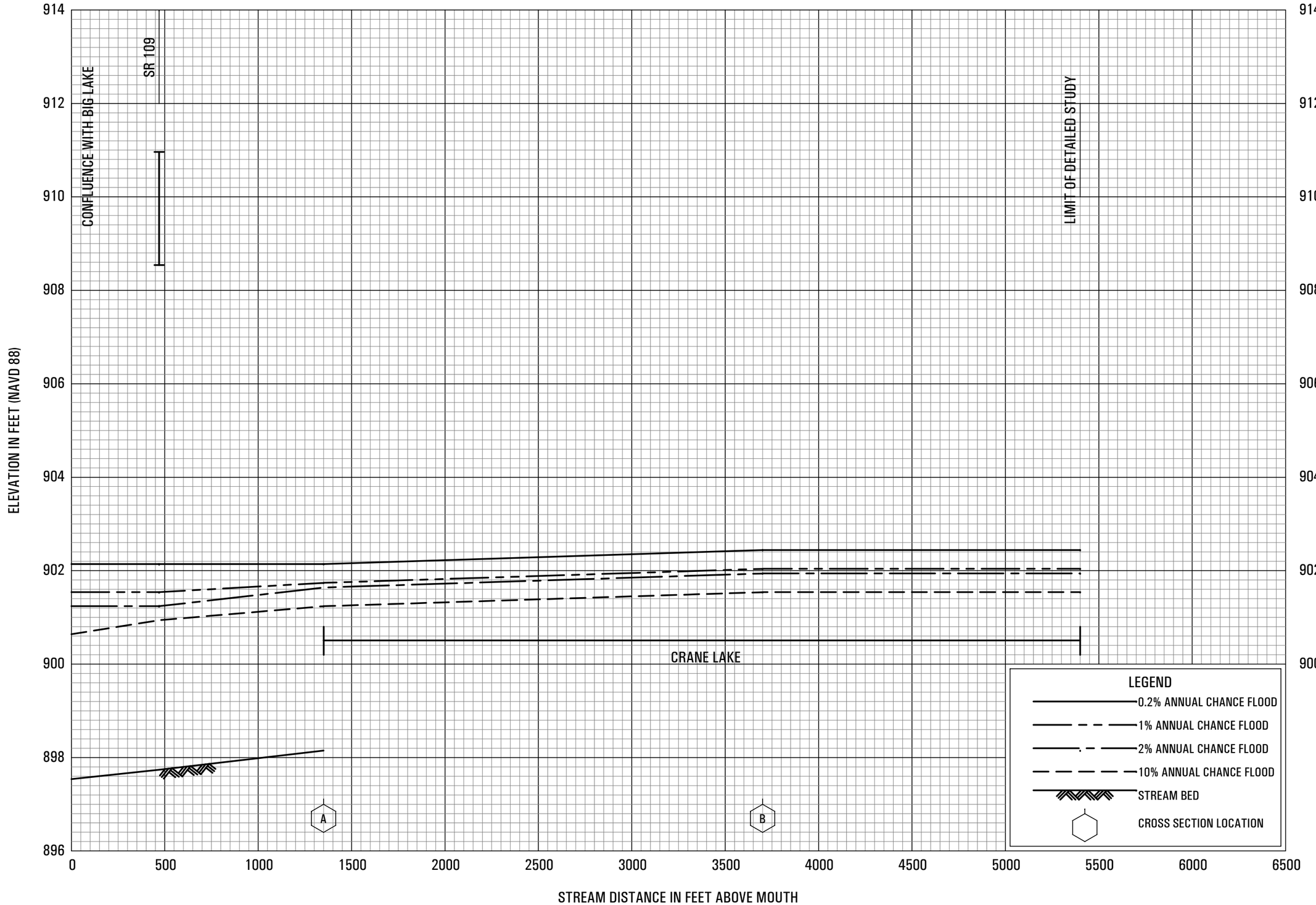
CARROL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE BOUNTY, IN

AND INCORPORATED AREAS

12P



FLOOD PROFILES

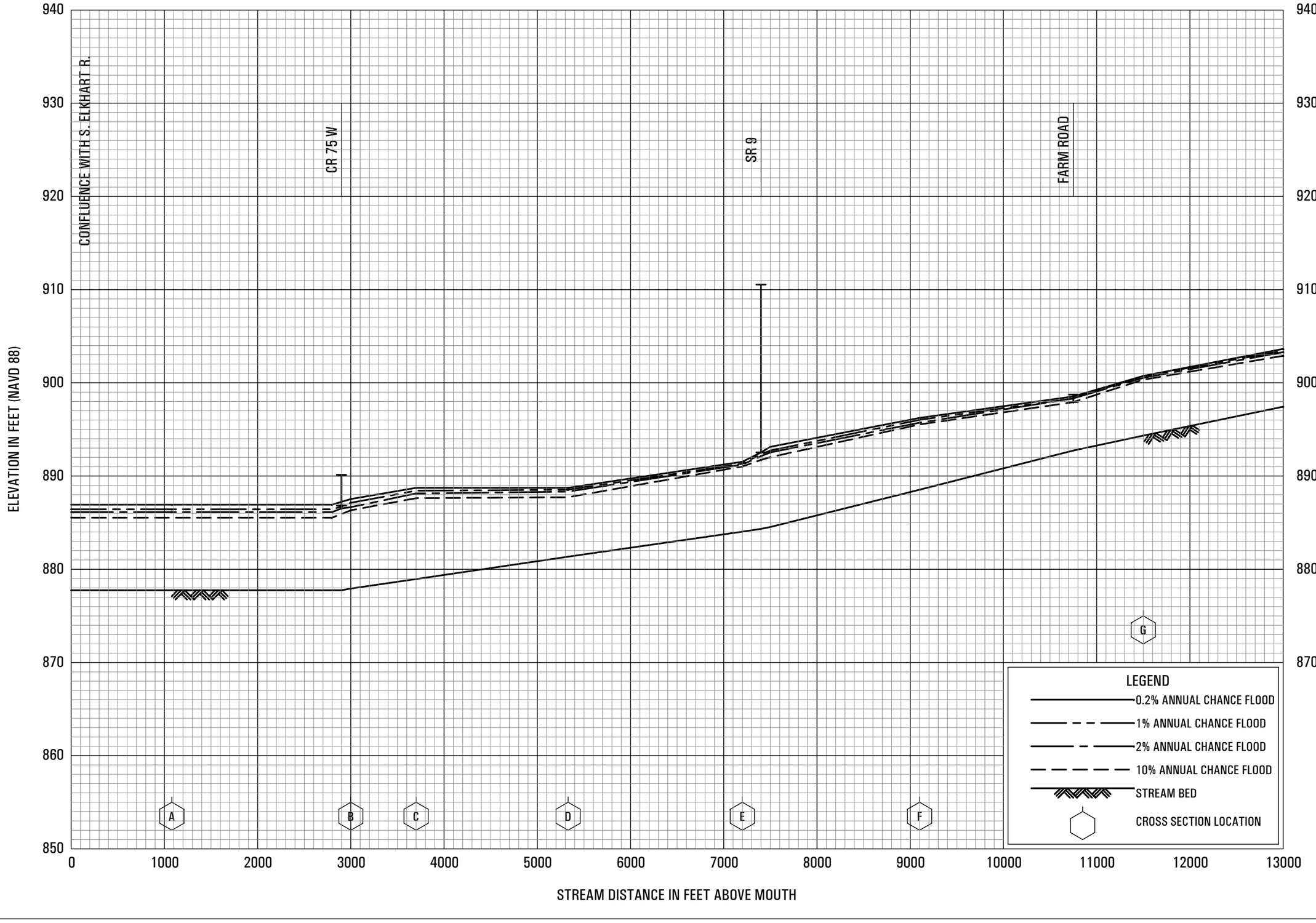
CRANE LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

13P



FLOOD PROFILES

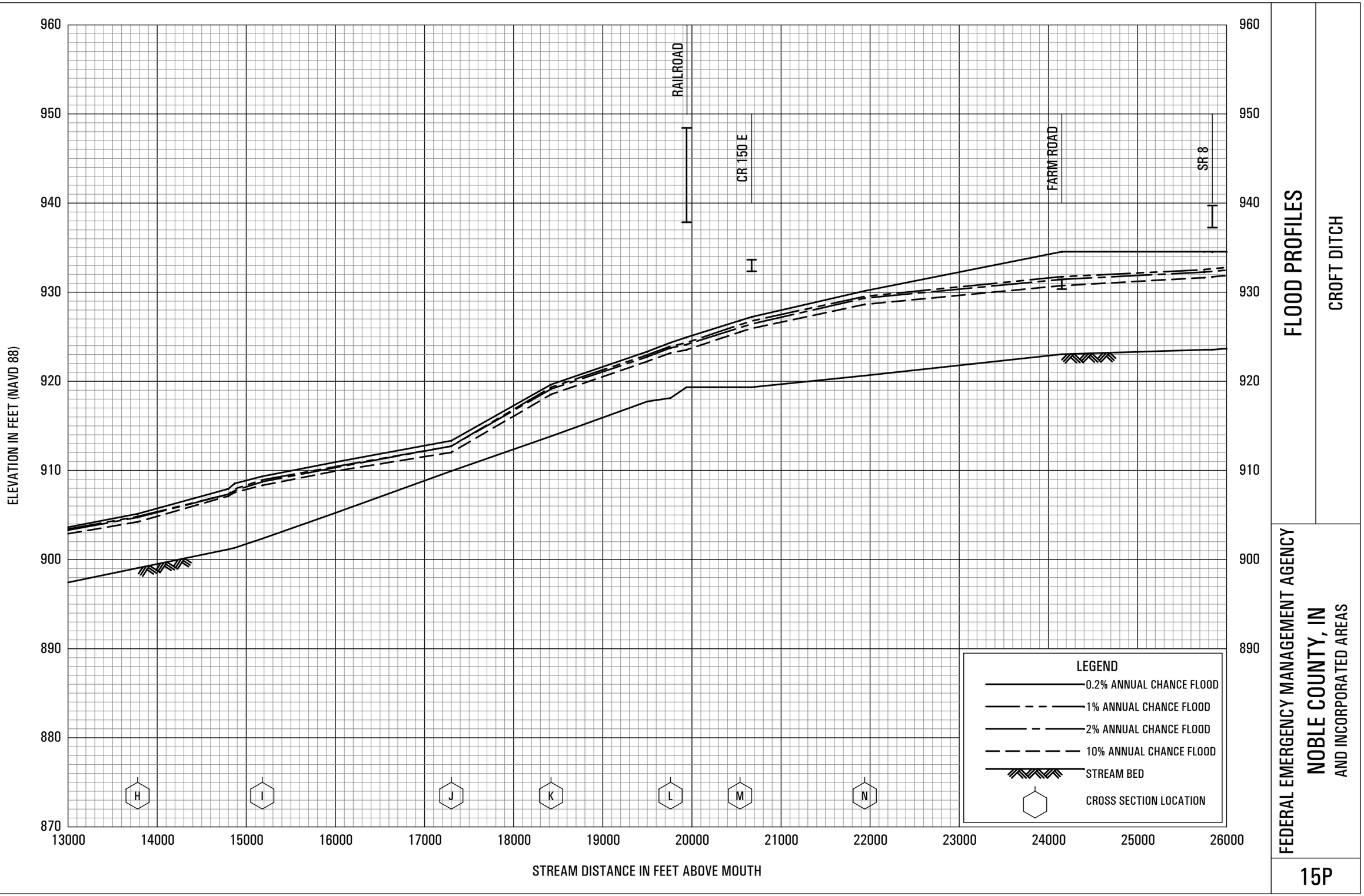
CROFT DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

14P



FLOOD PROFILES

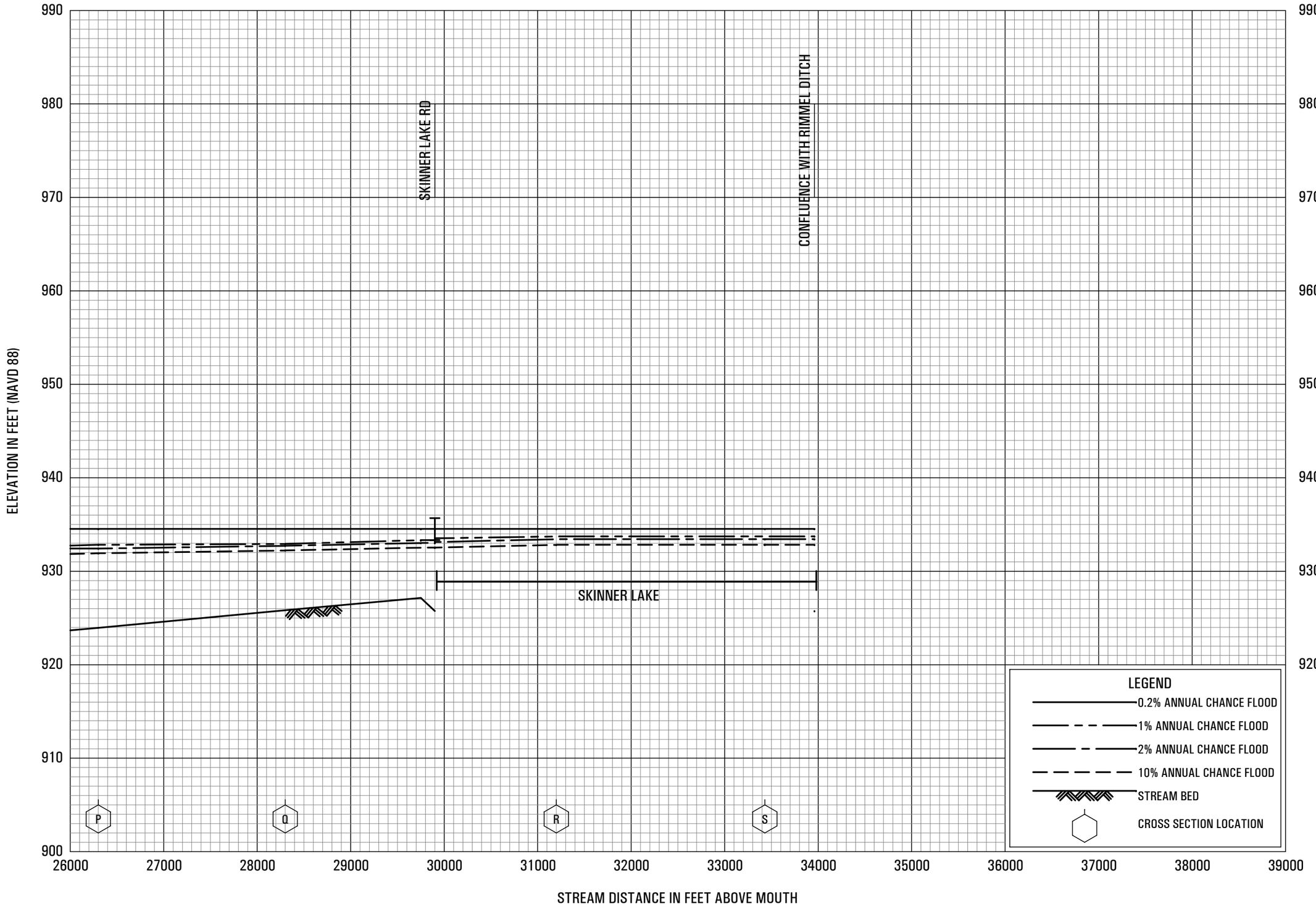
CROFT DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

15P



FLOOD PROFILES

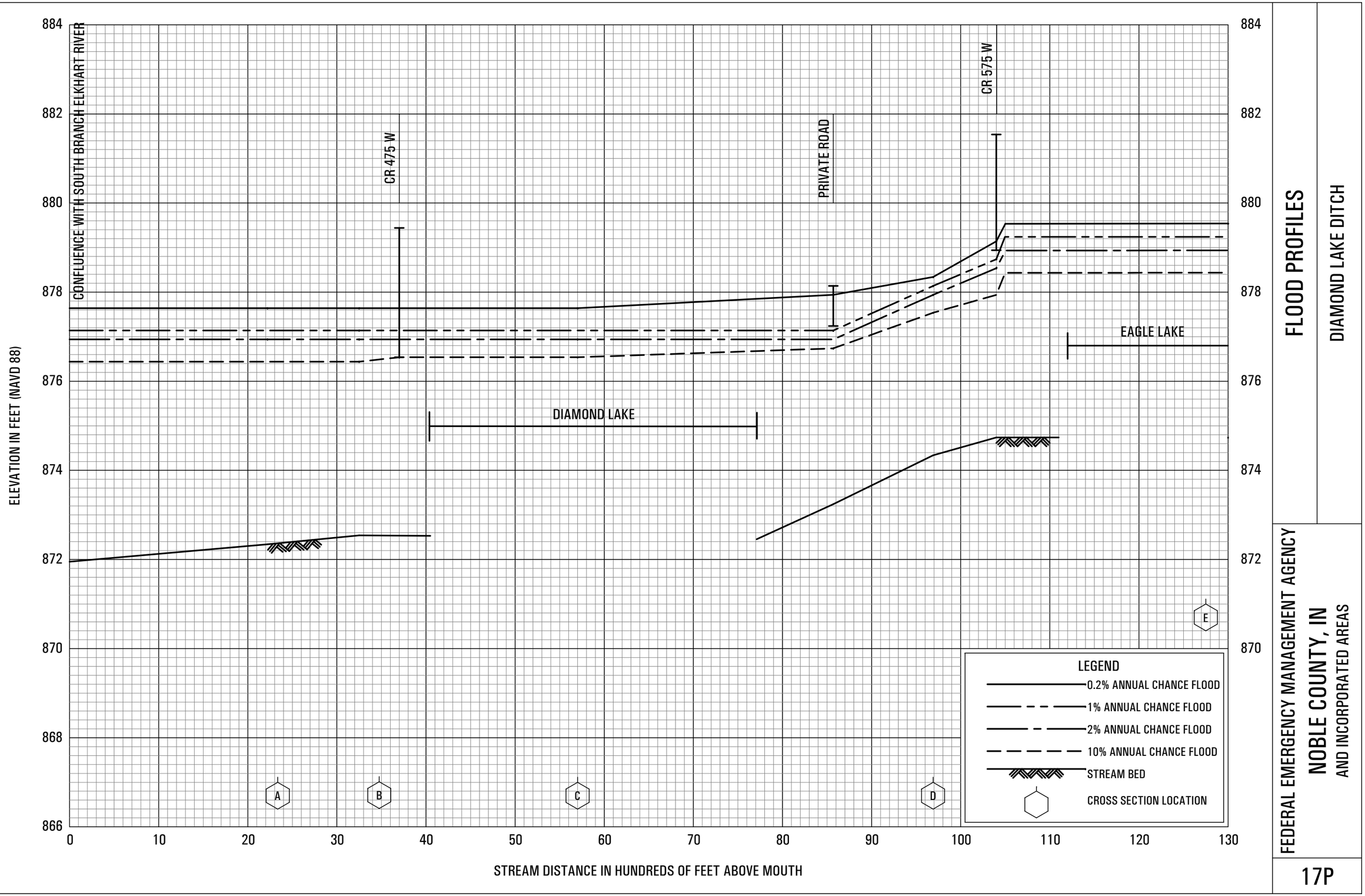
CROFT DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

16P



FLOOD PROFILES

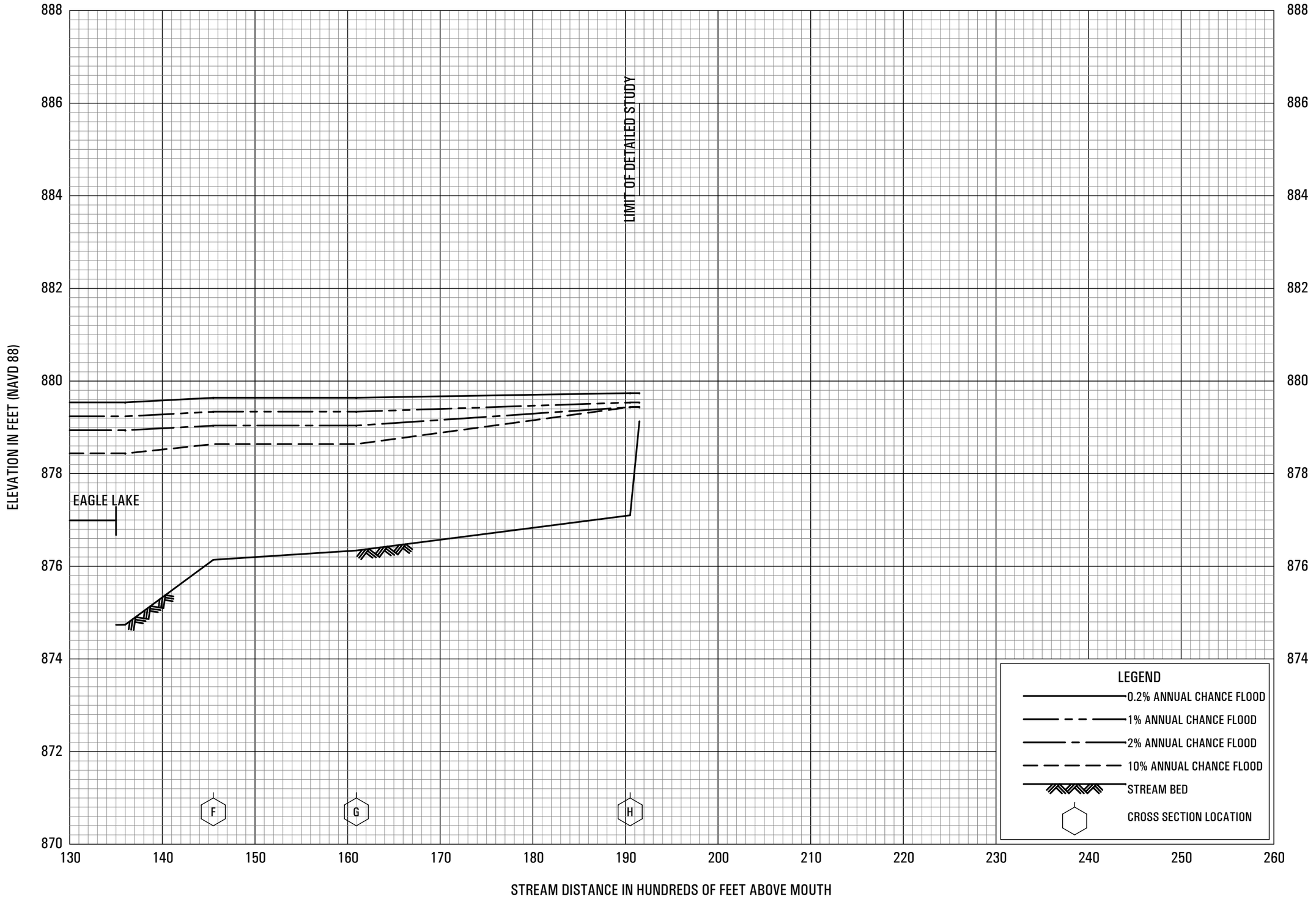
DIAMOND LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

17P



FLOOD PROFILES

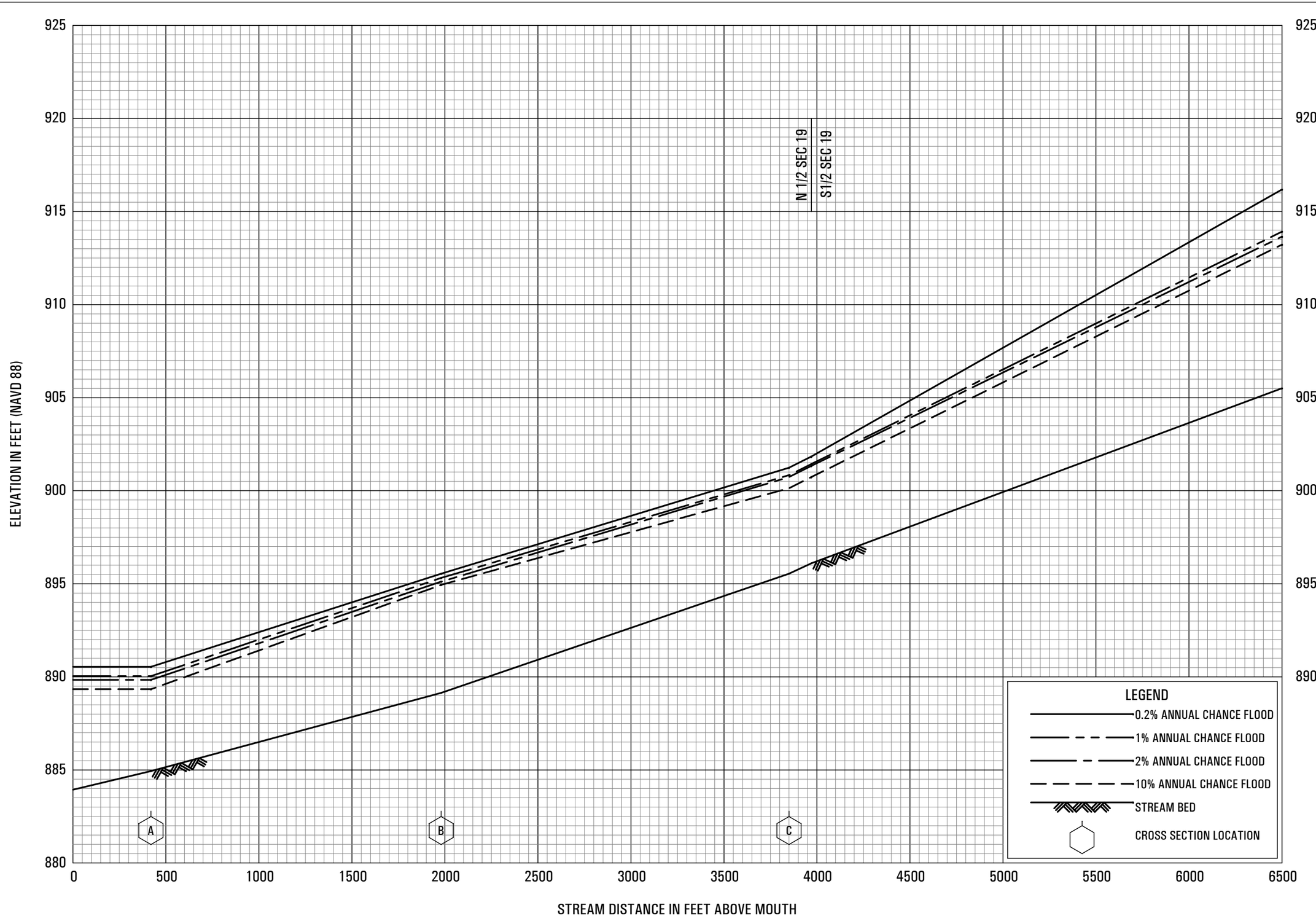
DIAMOND LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

18P



FLOOD PROFILES

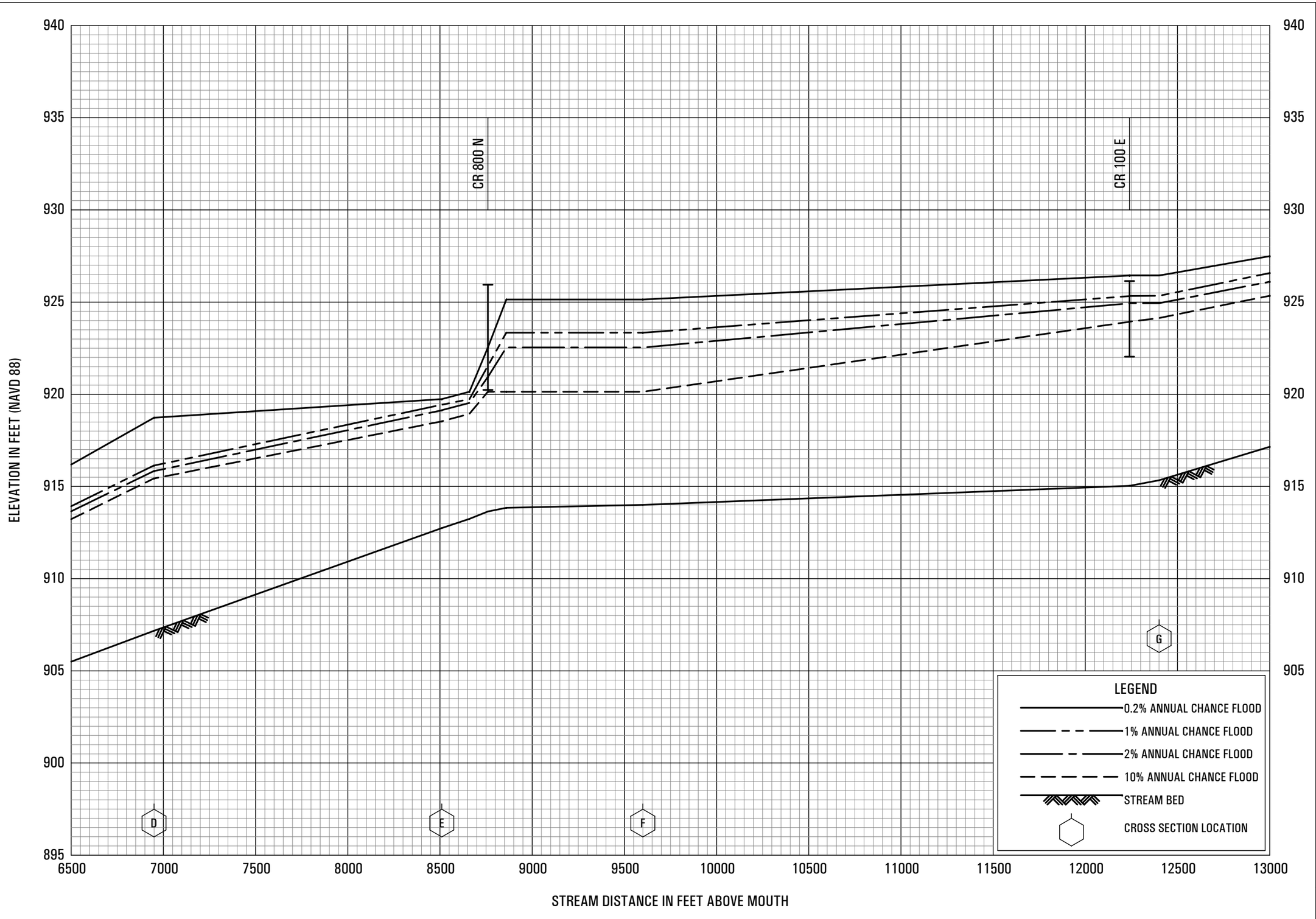
DRY RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

19P



FLOOD PROFILES

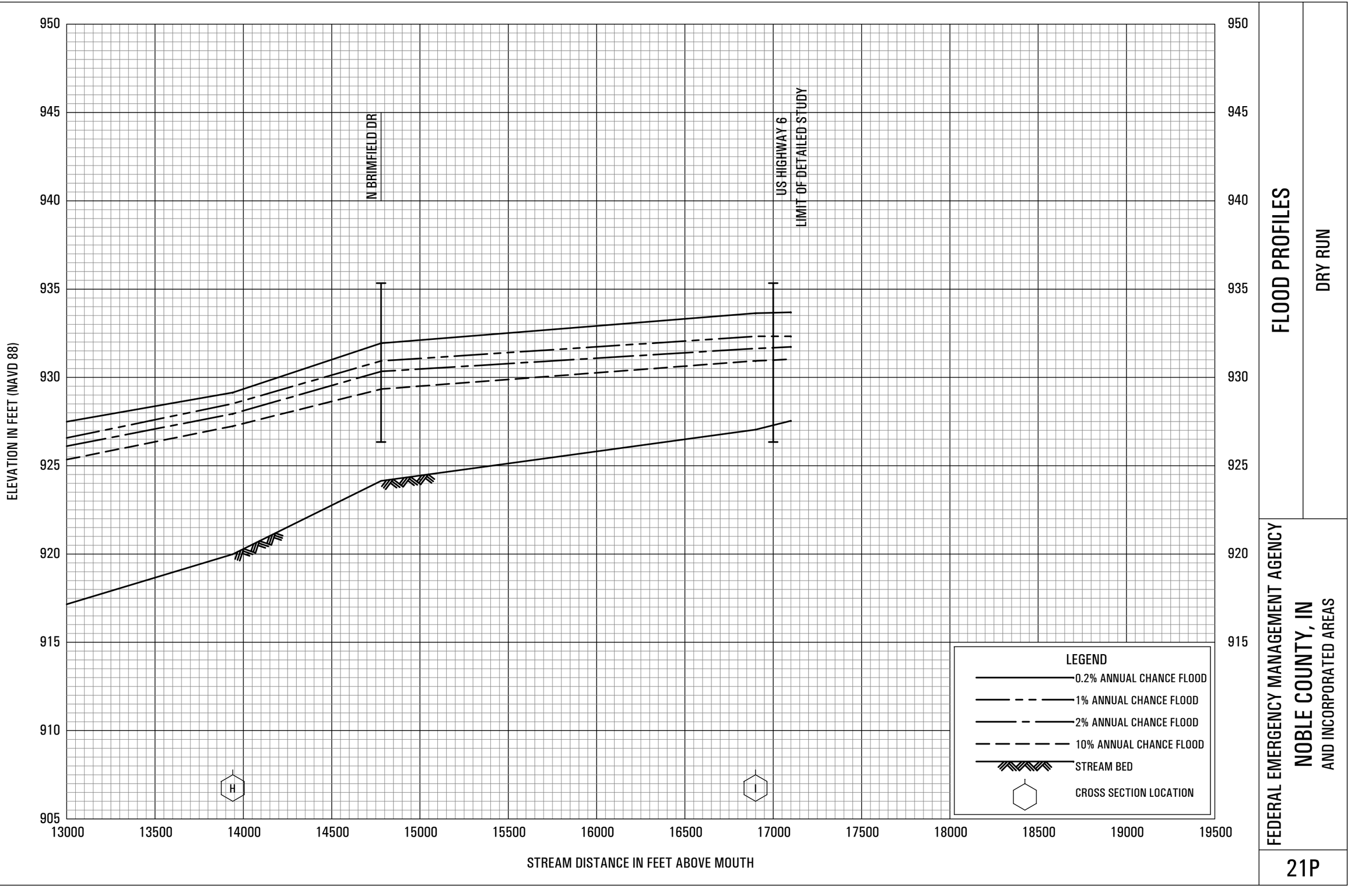
DRY RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

20P



FLOOD PROFILES

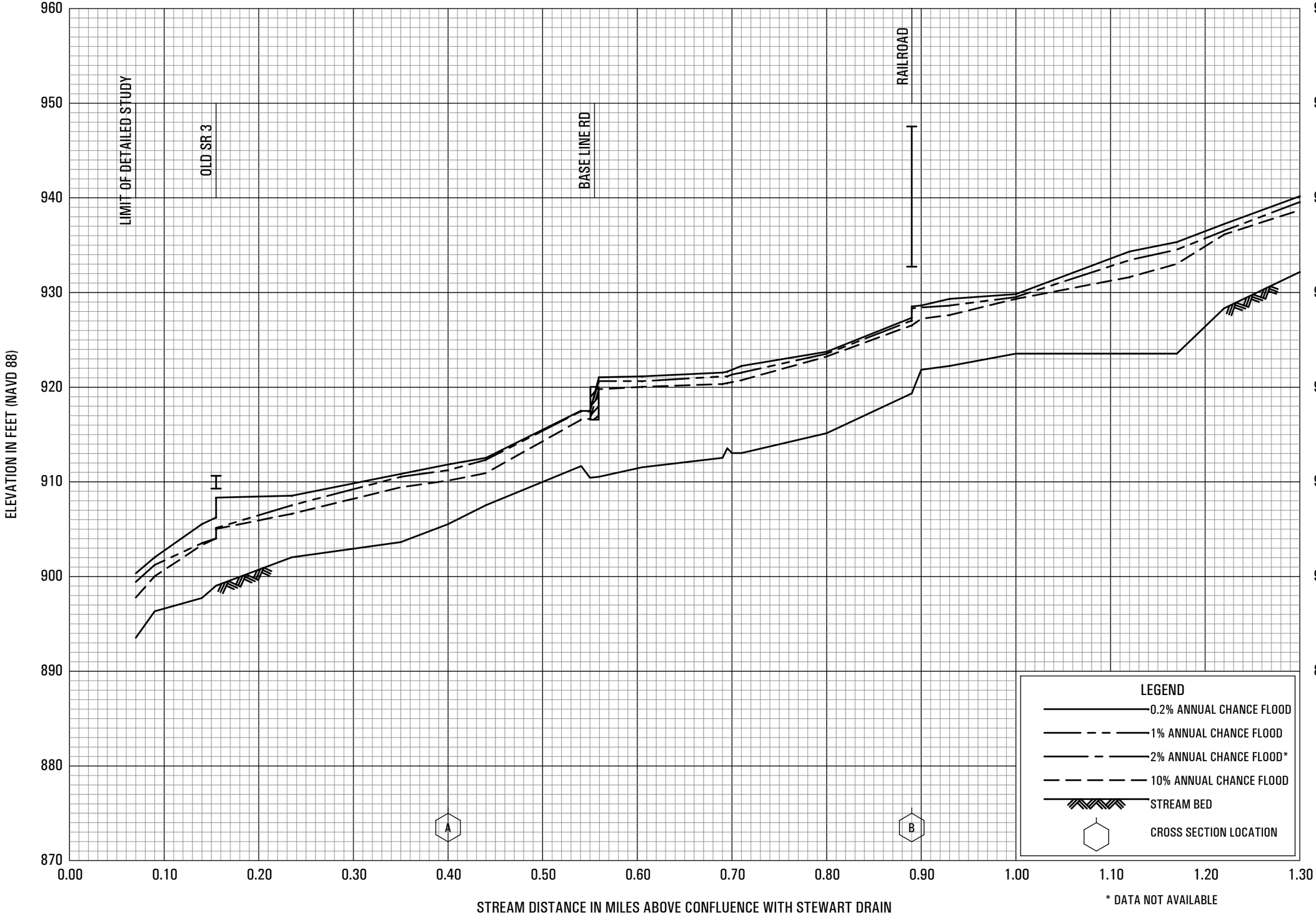
DRY RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

21P



FLOOD PROFILES

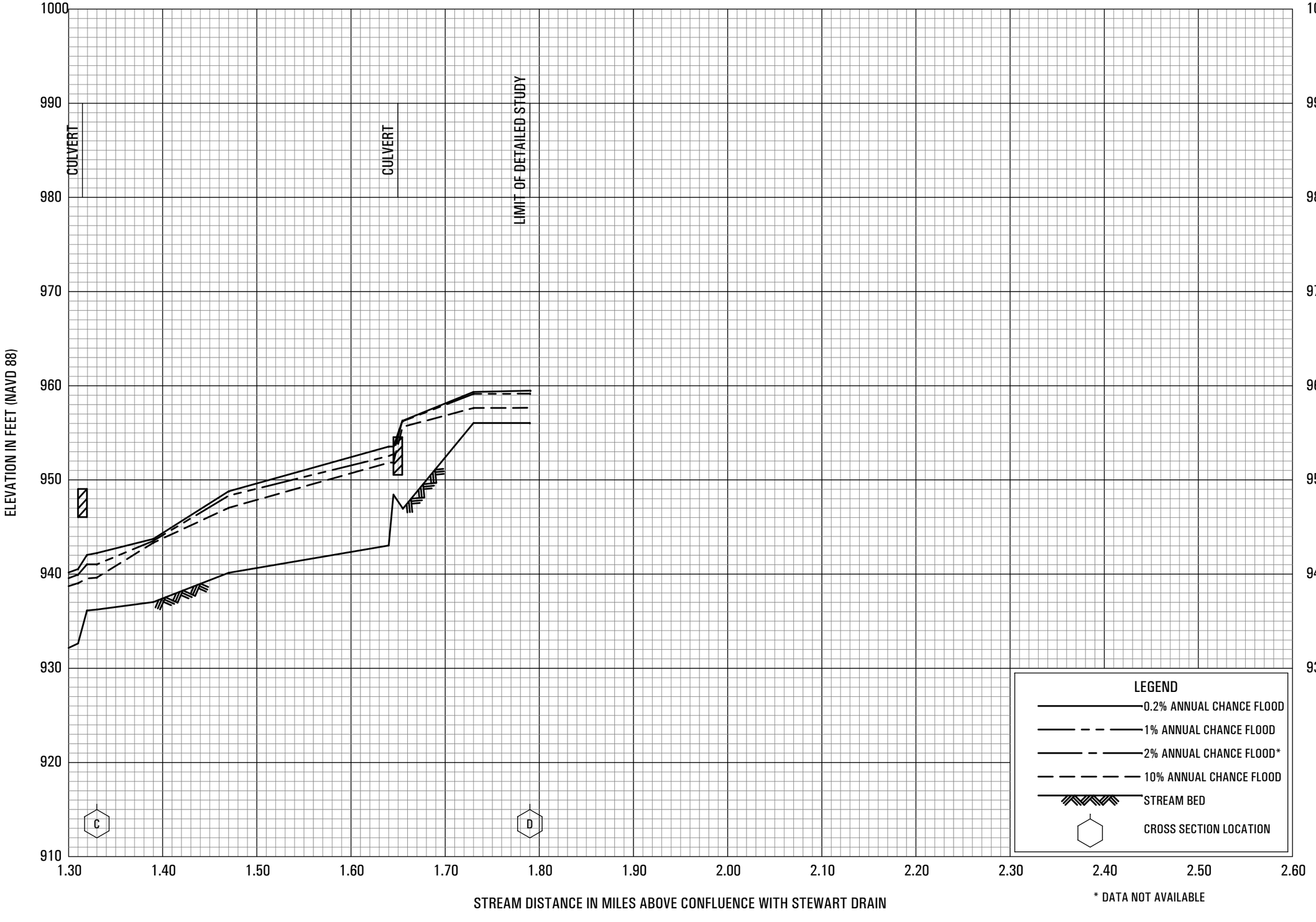
ELEY DRAIN

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

22P



FLOOD PROFILES

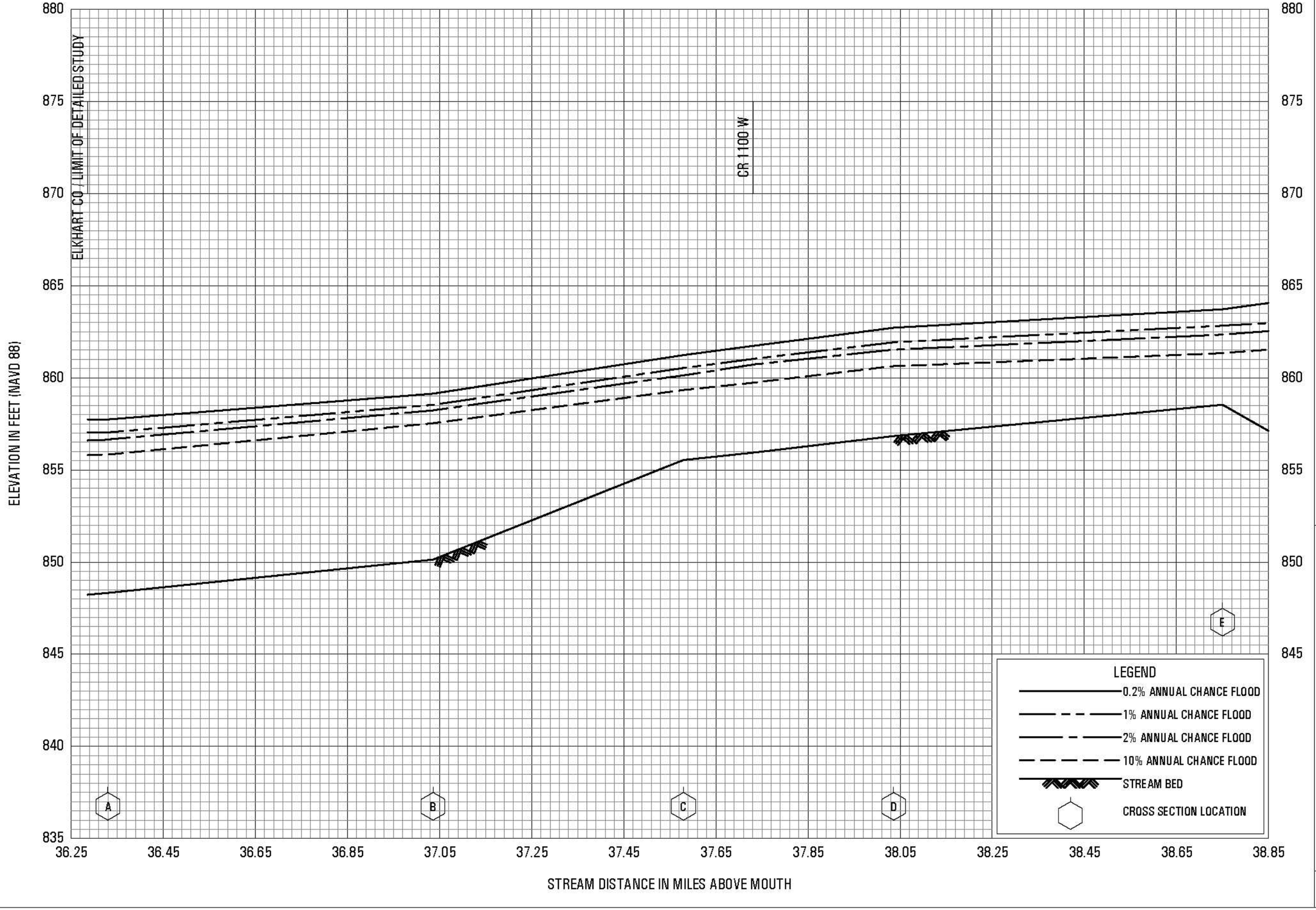
ELEY DRAIN

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

23P



FLOOD PROFILES

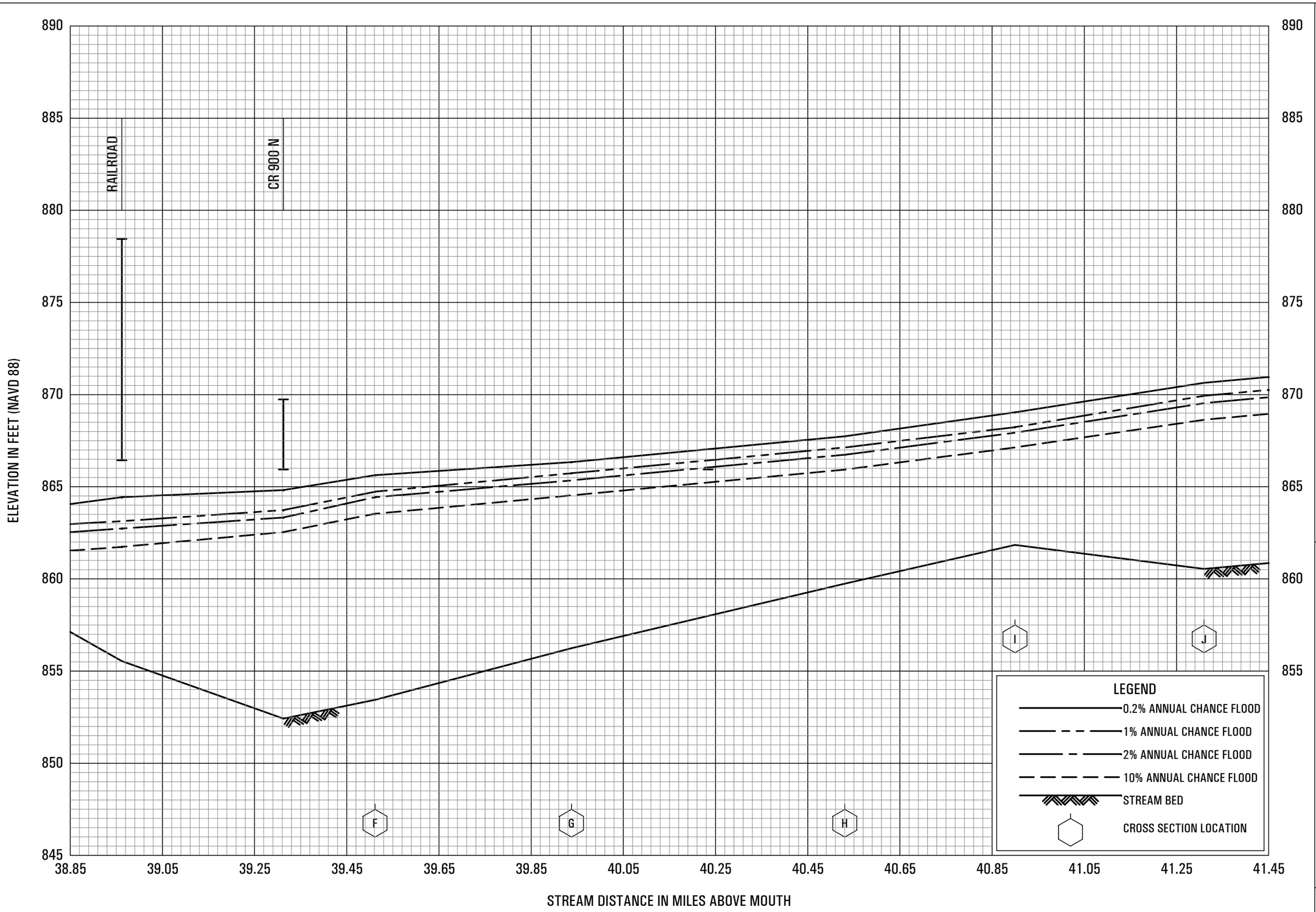
ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

24P



FLOOD PROFILES

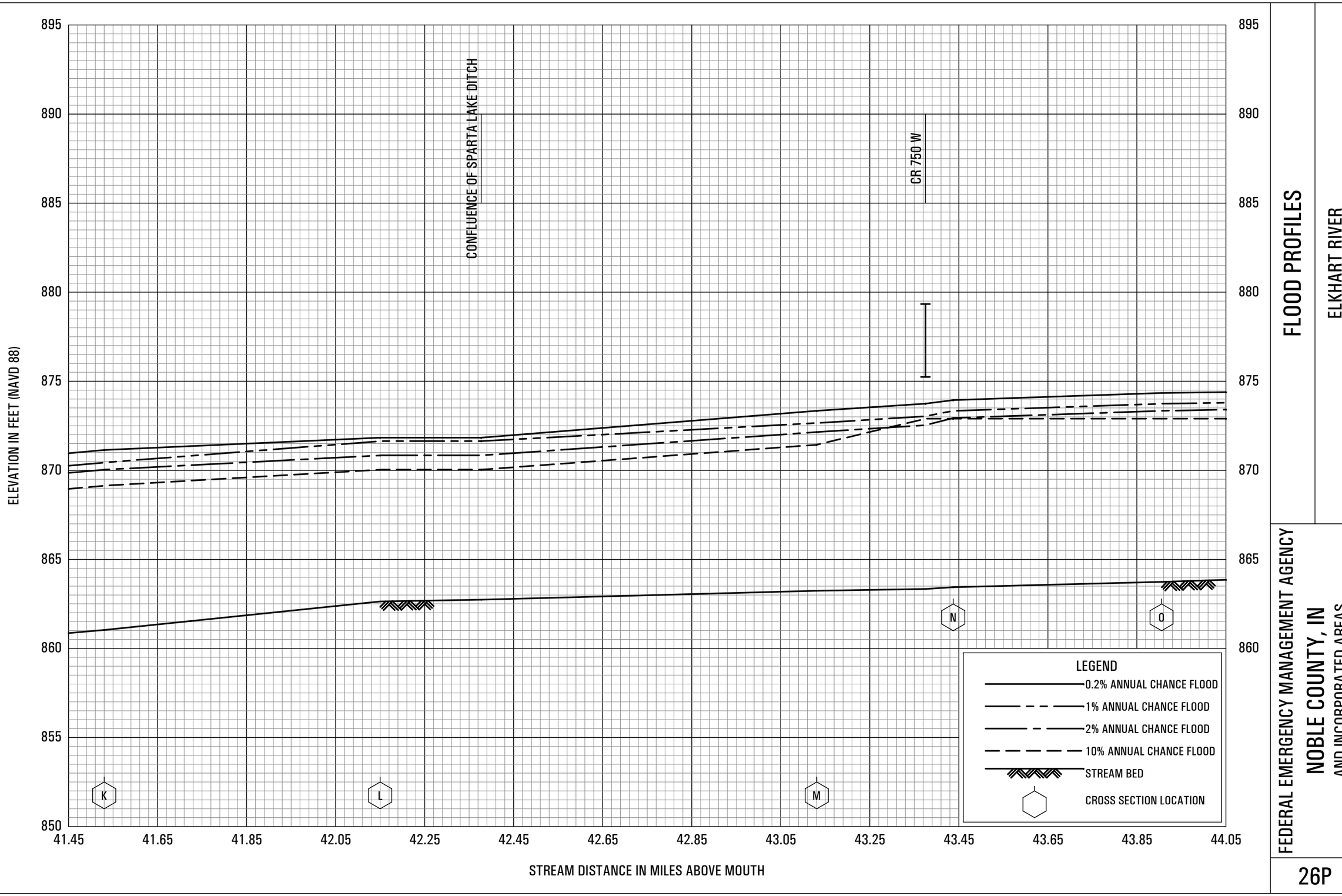
ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

25P



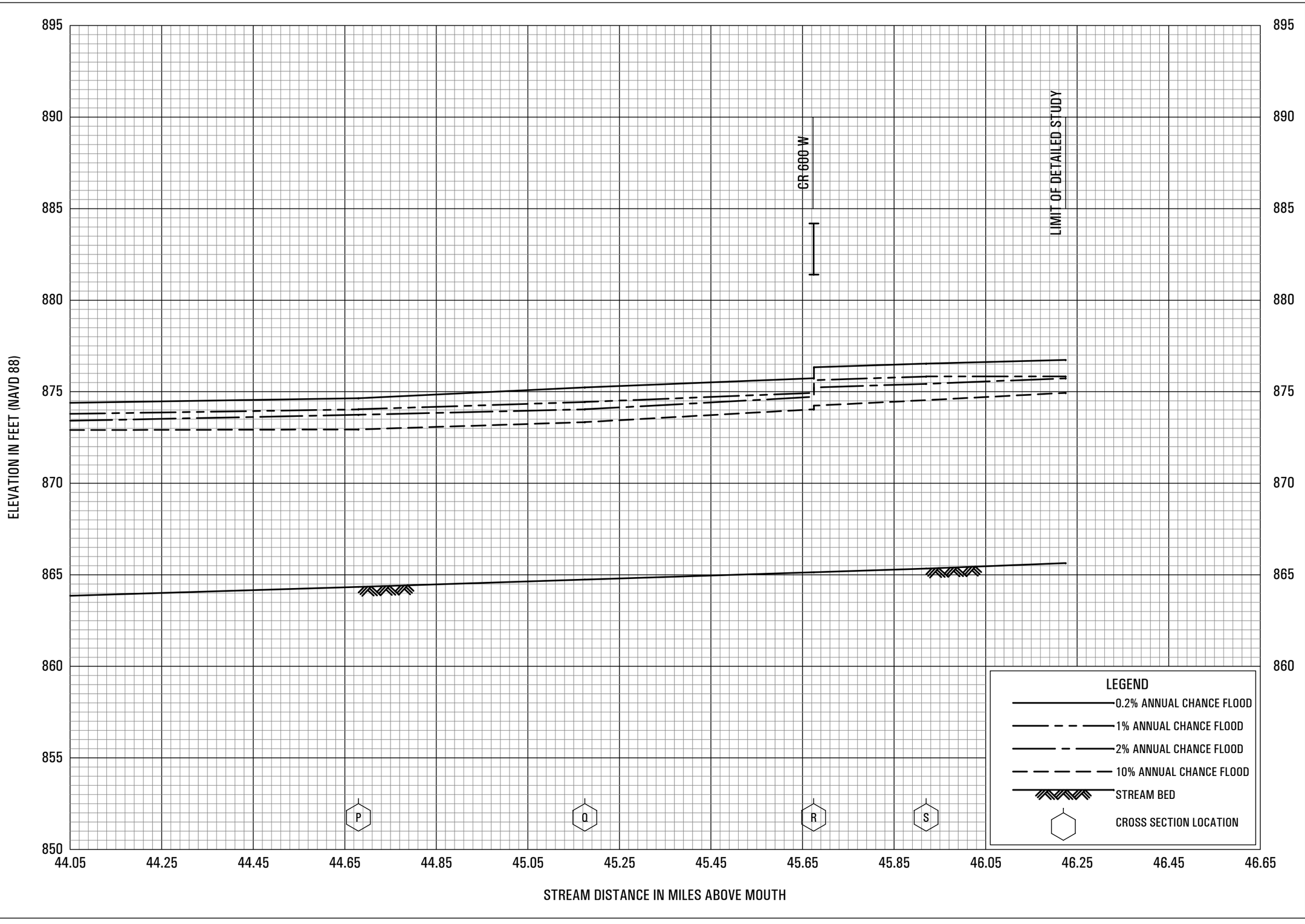
FLOOD PROFILES

ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

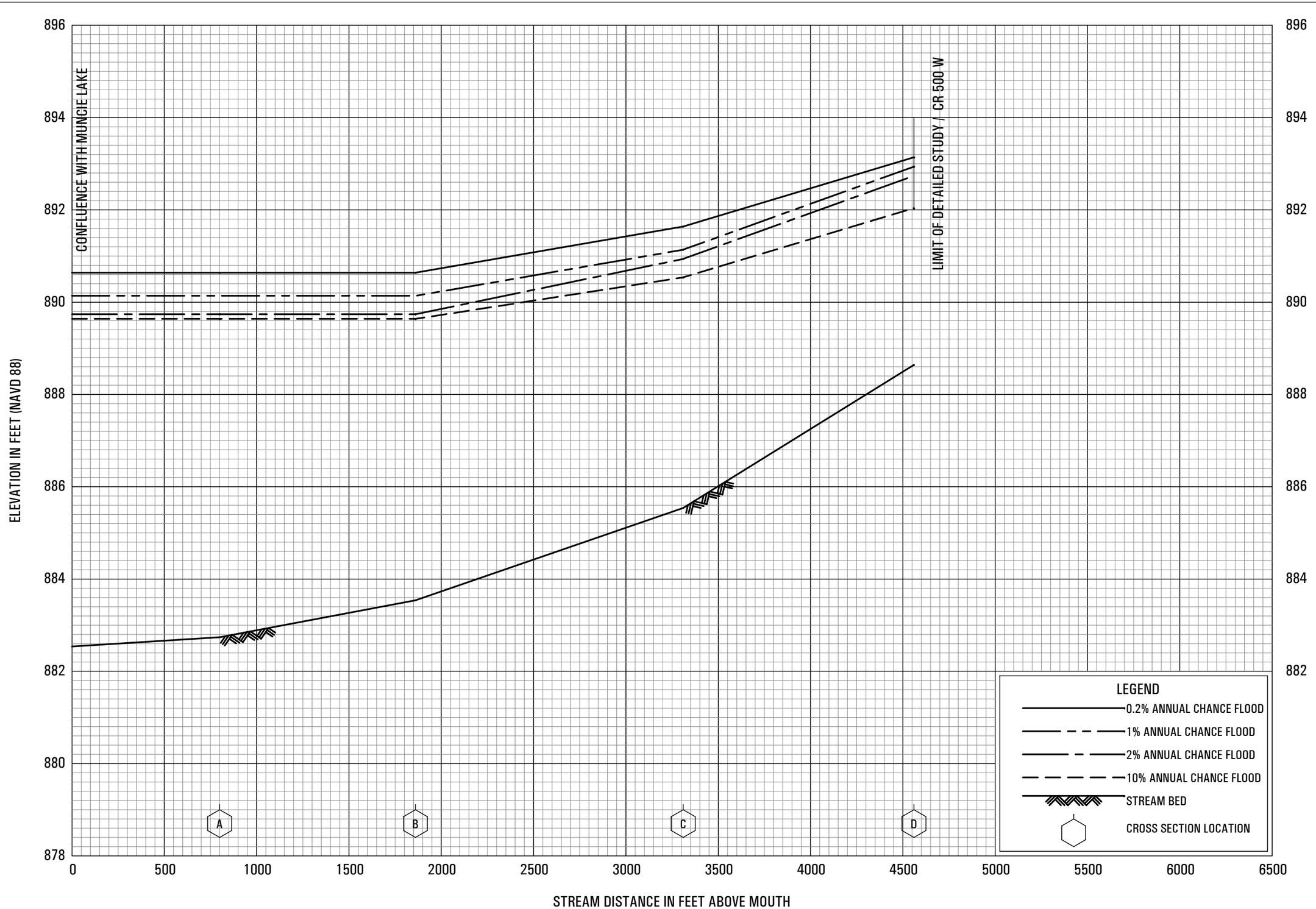
ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

27P



FLOOD PROFILES

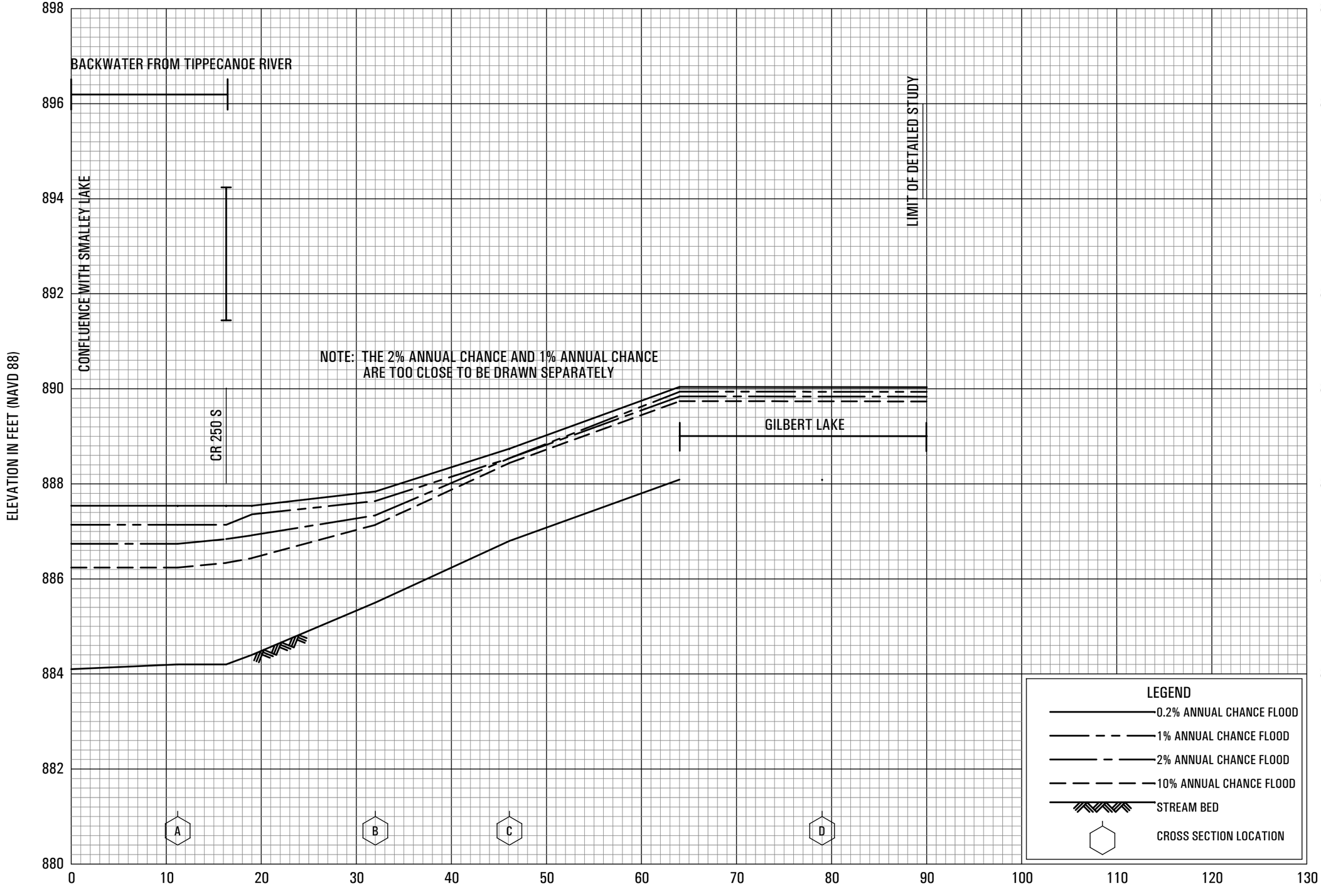
FORKER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

28P



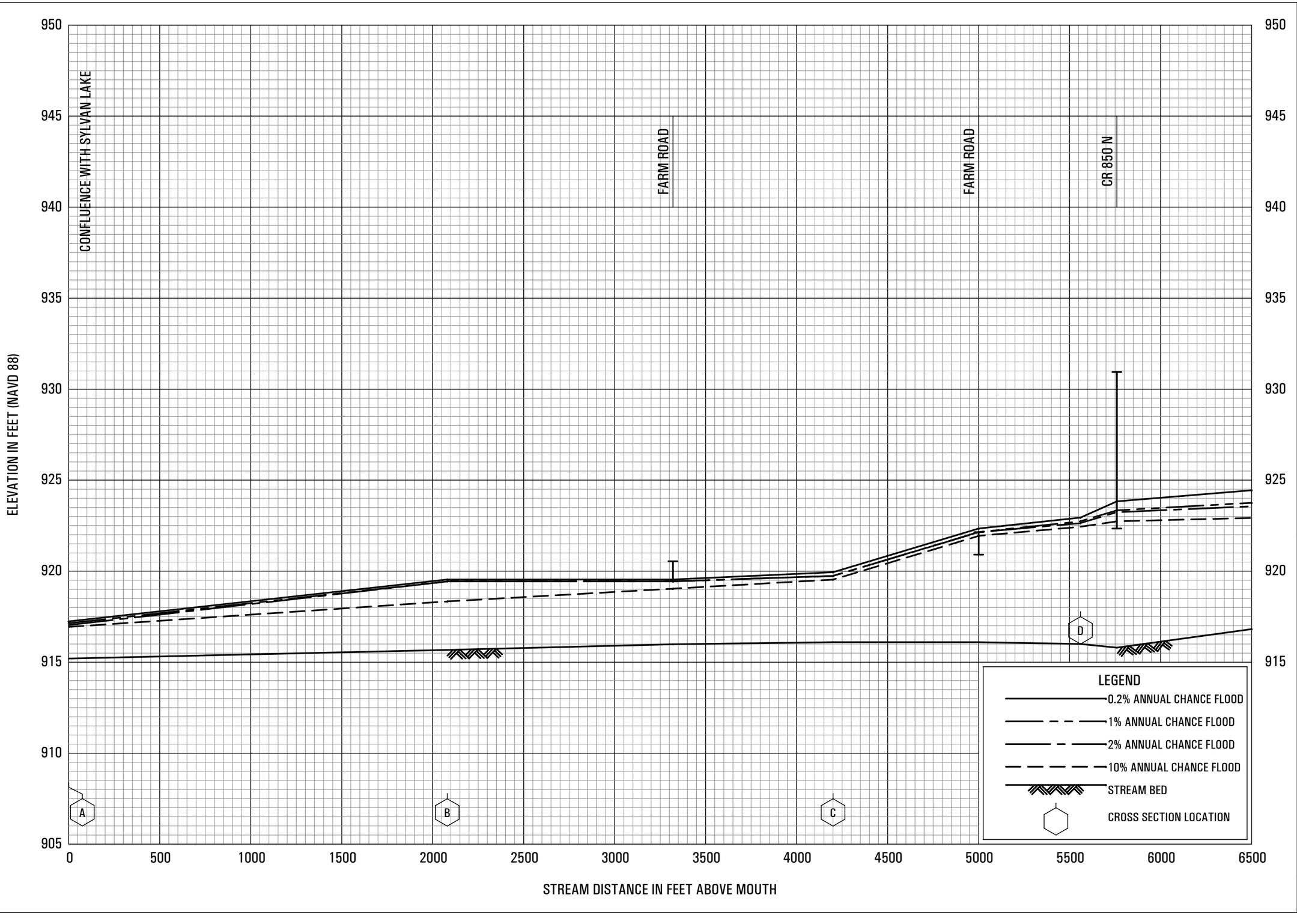
FLOOD PROFILES

GILBERT LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



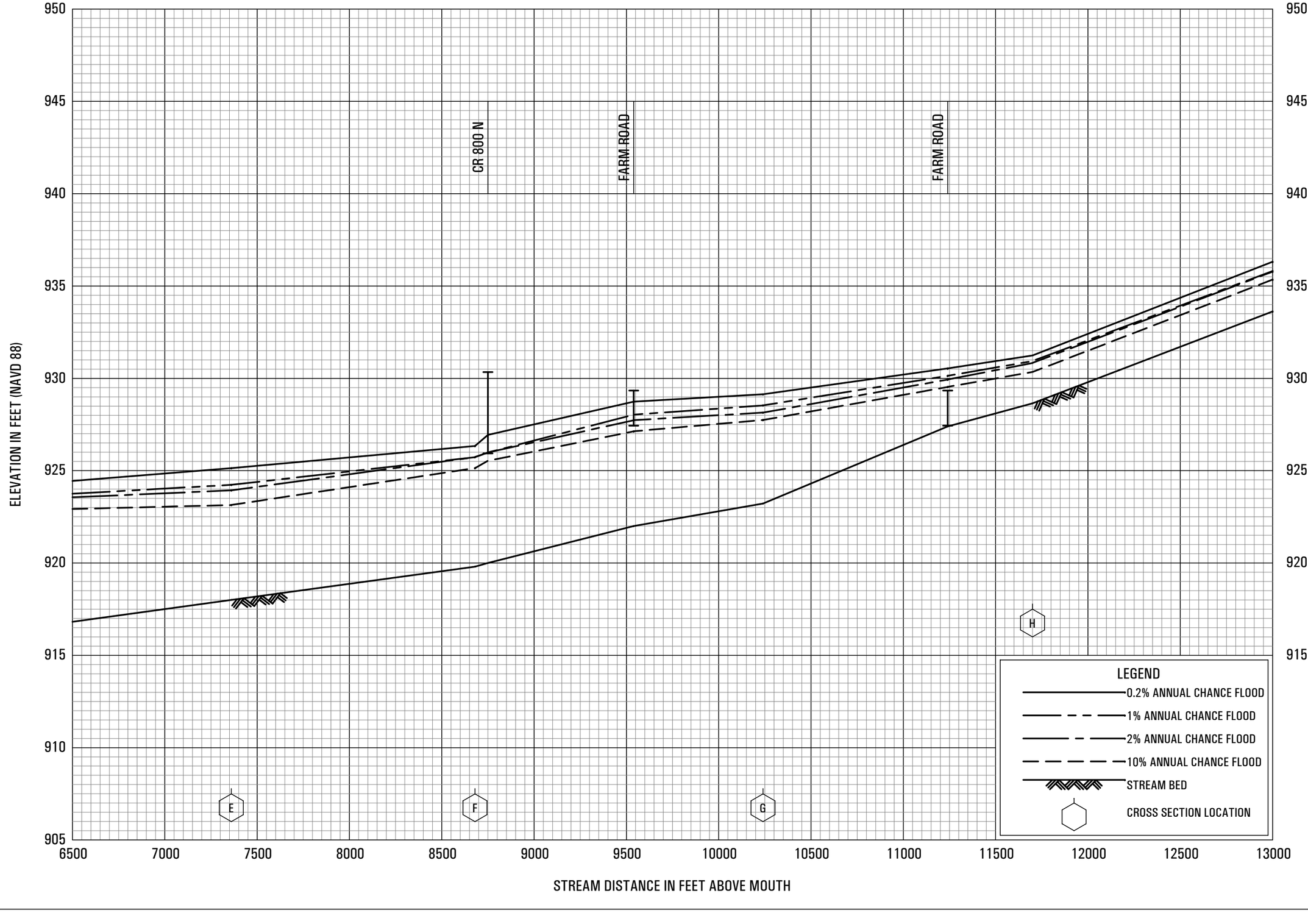
FLOOD PROFILES

HENDERSON LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



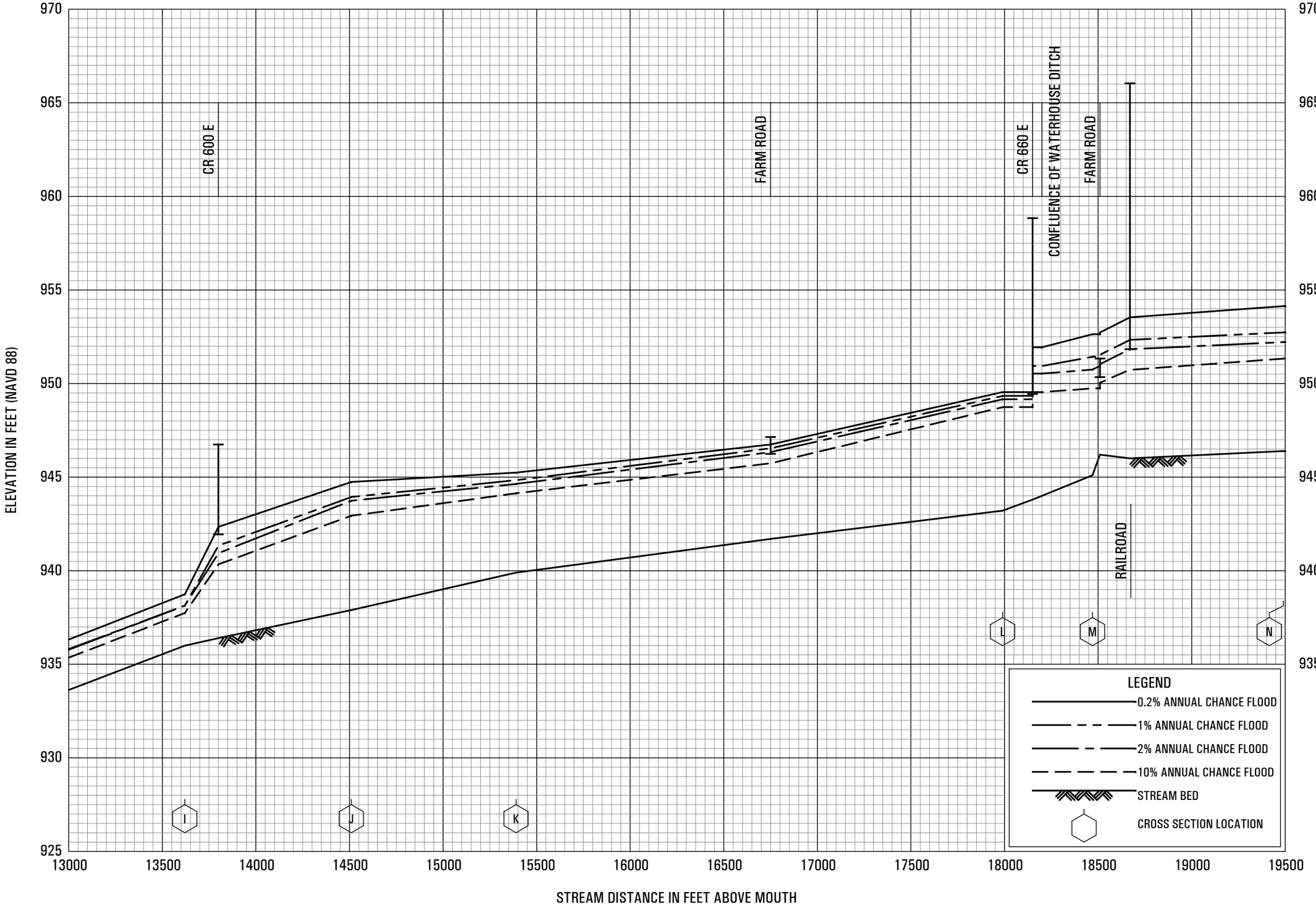
FLOOD PROFILES

HENDERSON LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



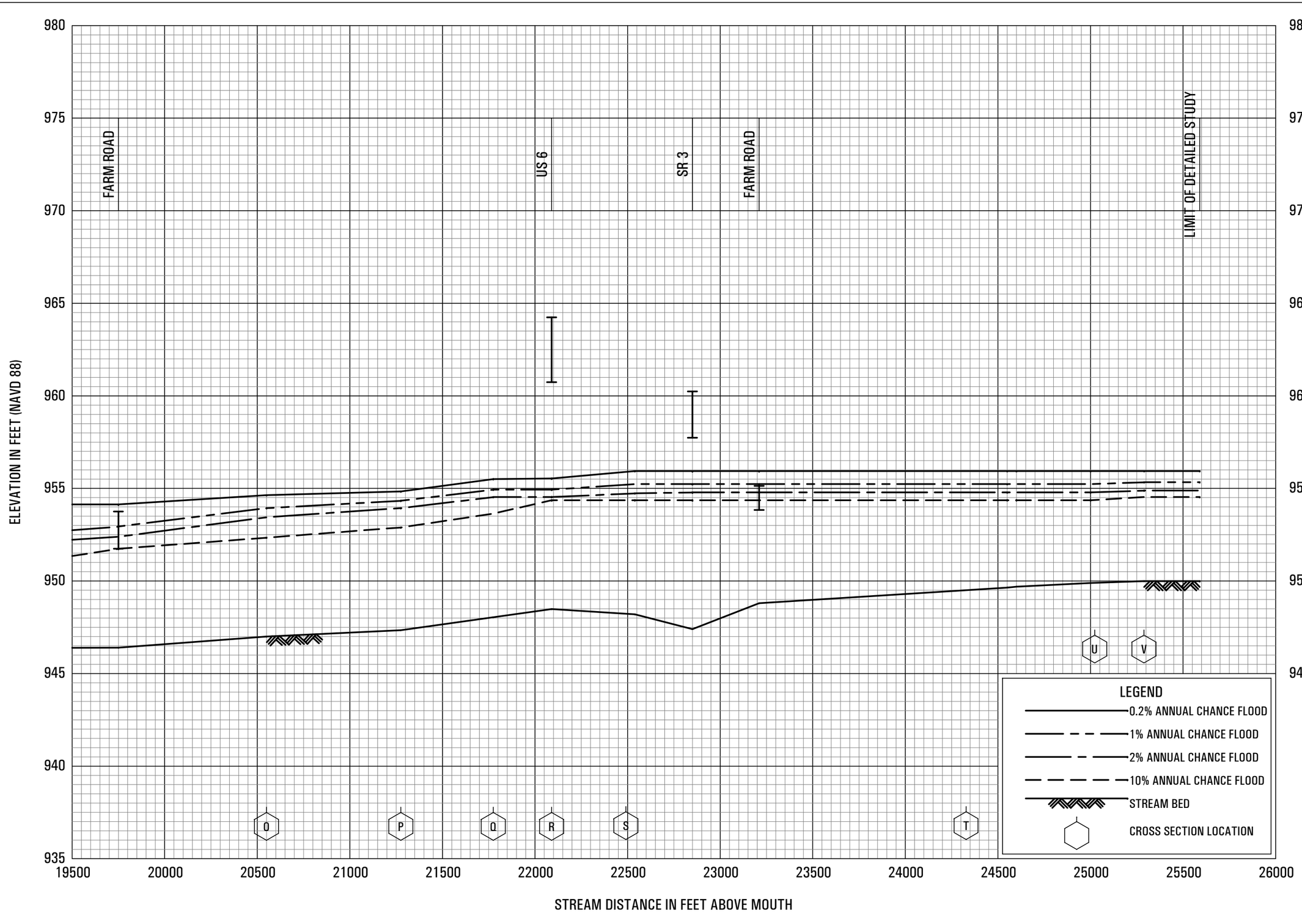
FLOOD PROFILES

HENDERSON LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

HENDERSON LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

33P

FLOOD PROFILES

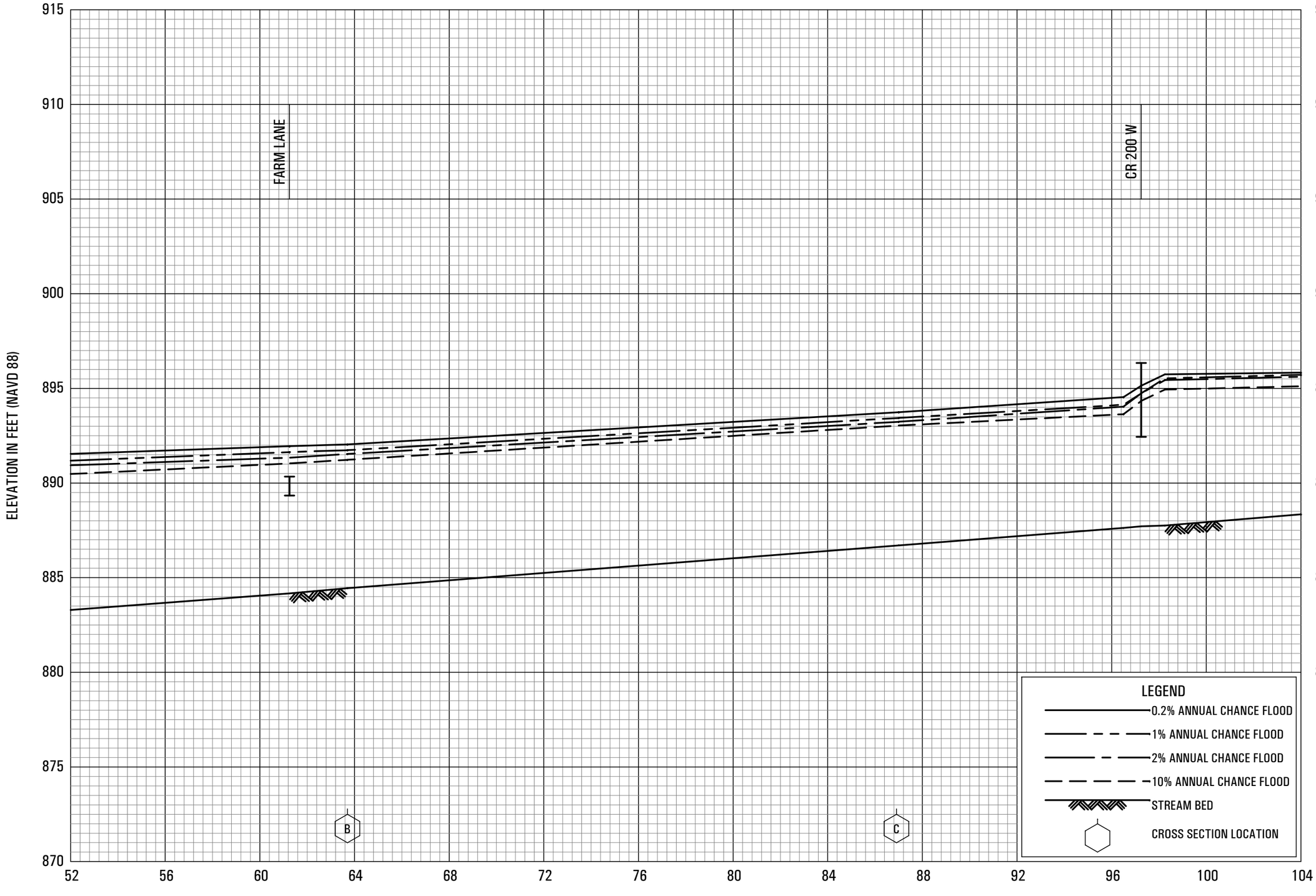
HUSTON DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

34P



FLOOD PROFILES

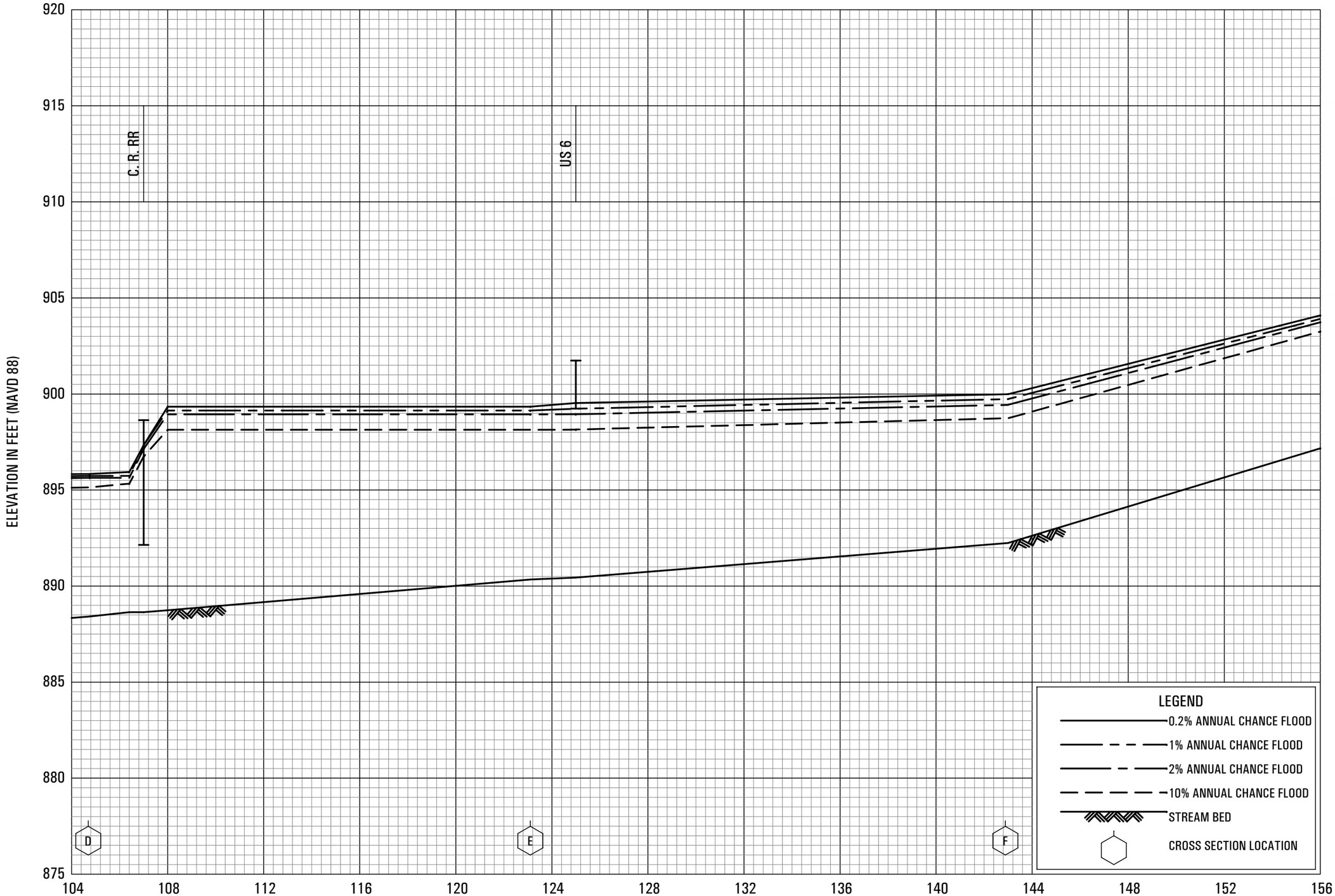
HUSTON DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

35P



FLOOD PROFILES

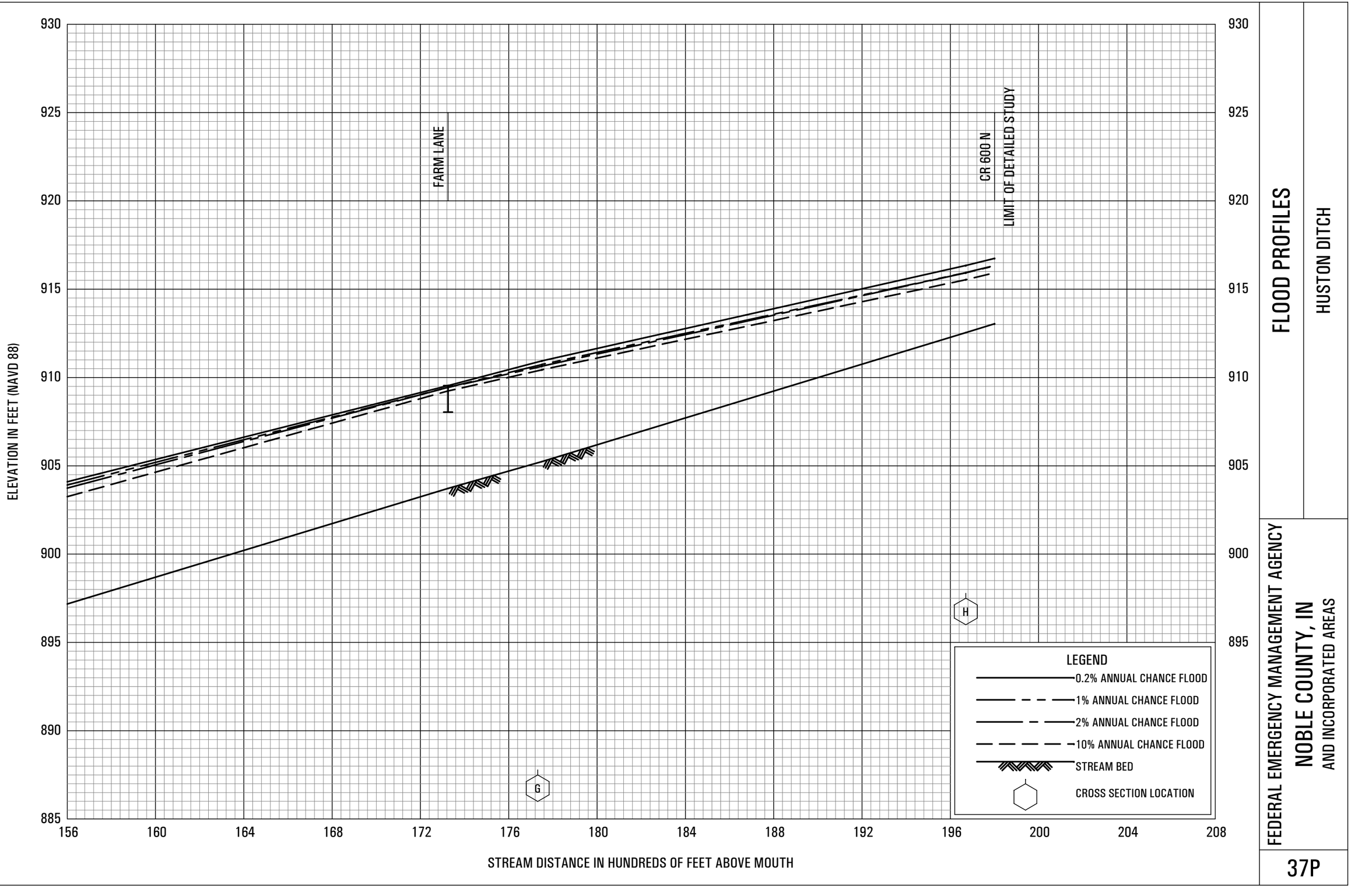
HUSTON DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

36P



FLOOD PROFILES

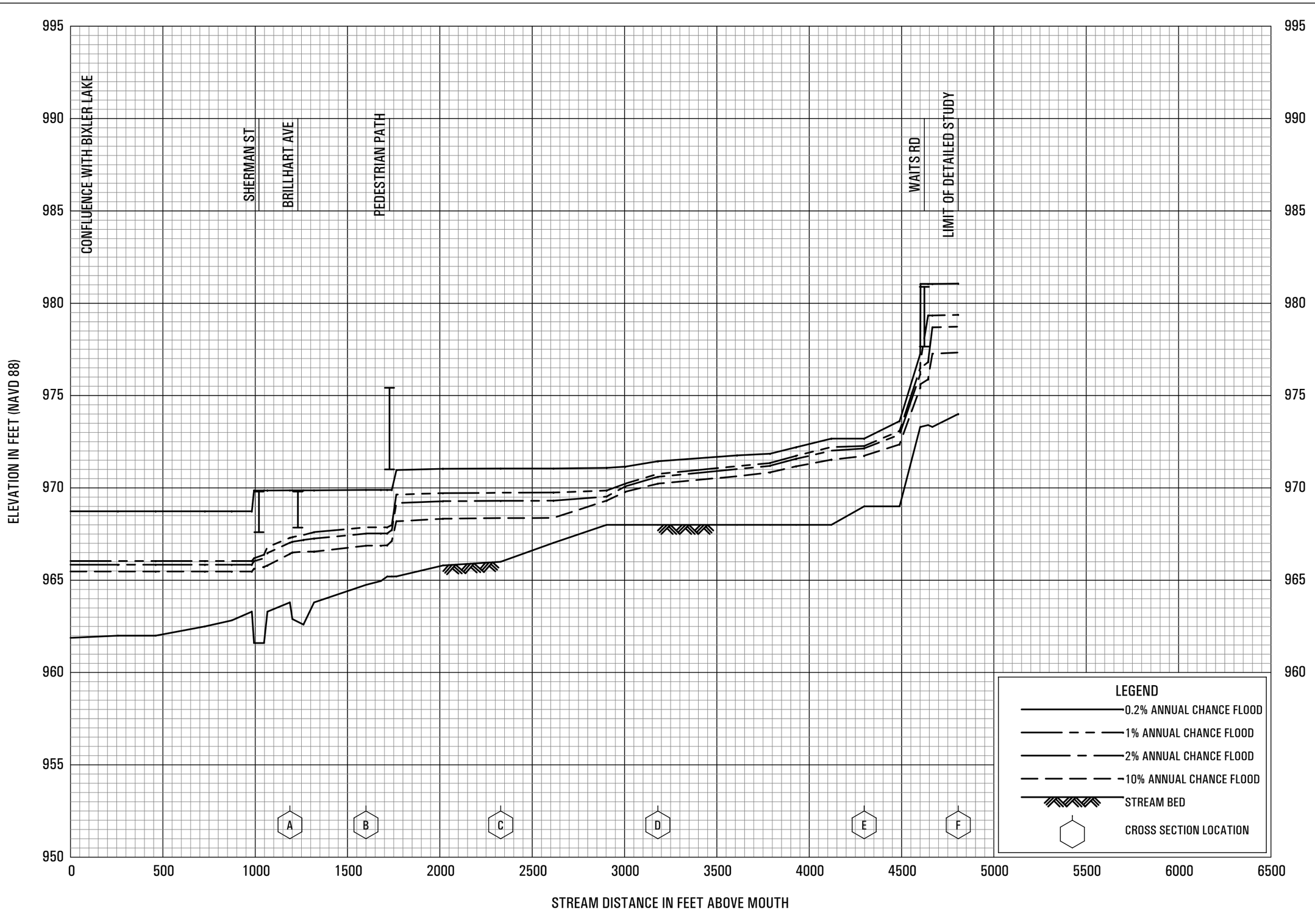
HUSTON DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

37P



FLOOD PROFILES

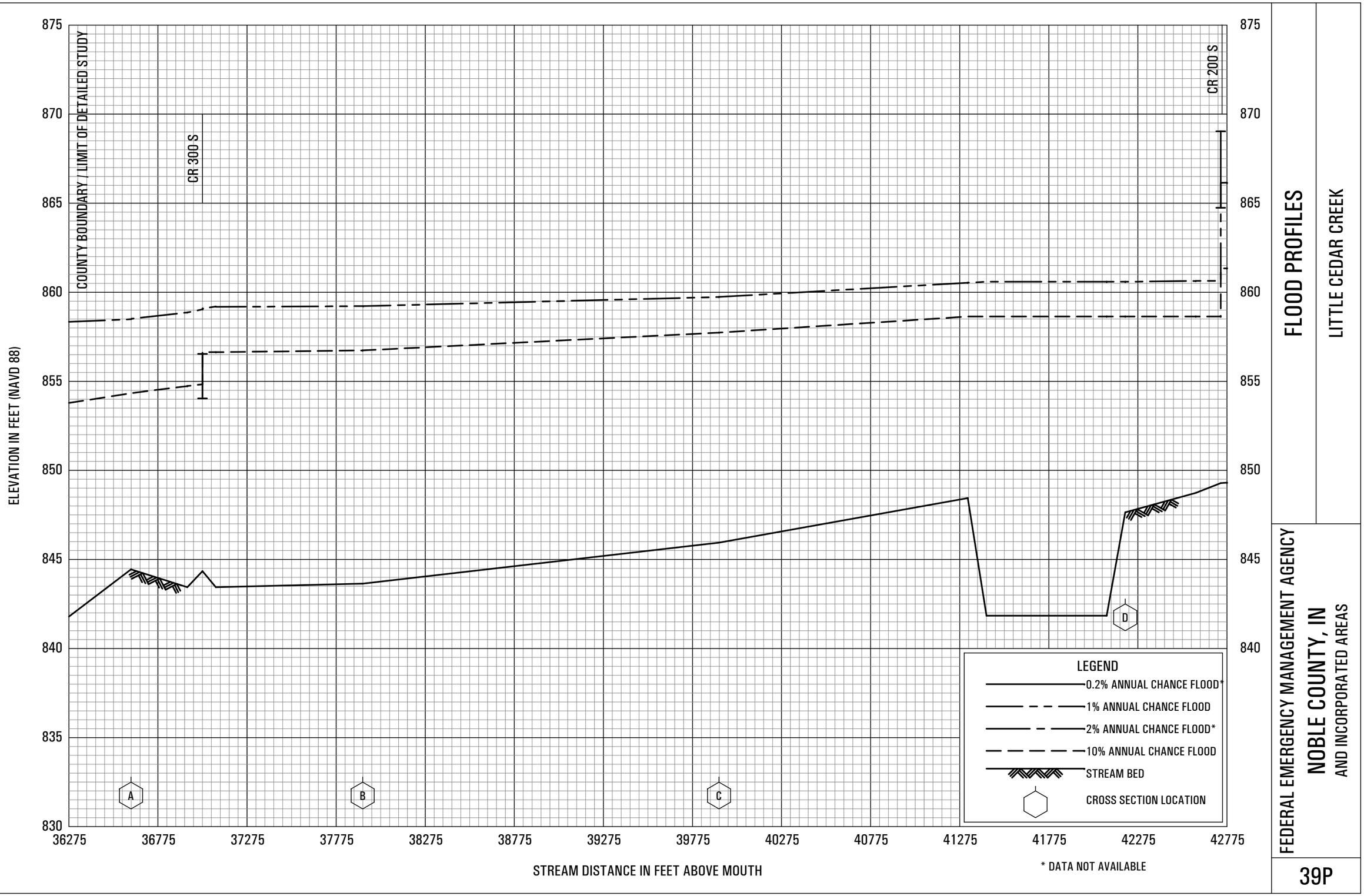
LASH DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

38P



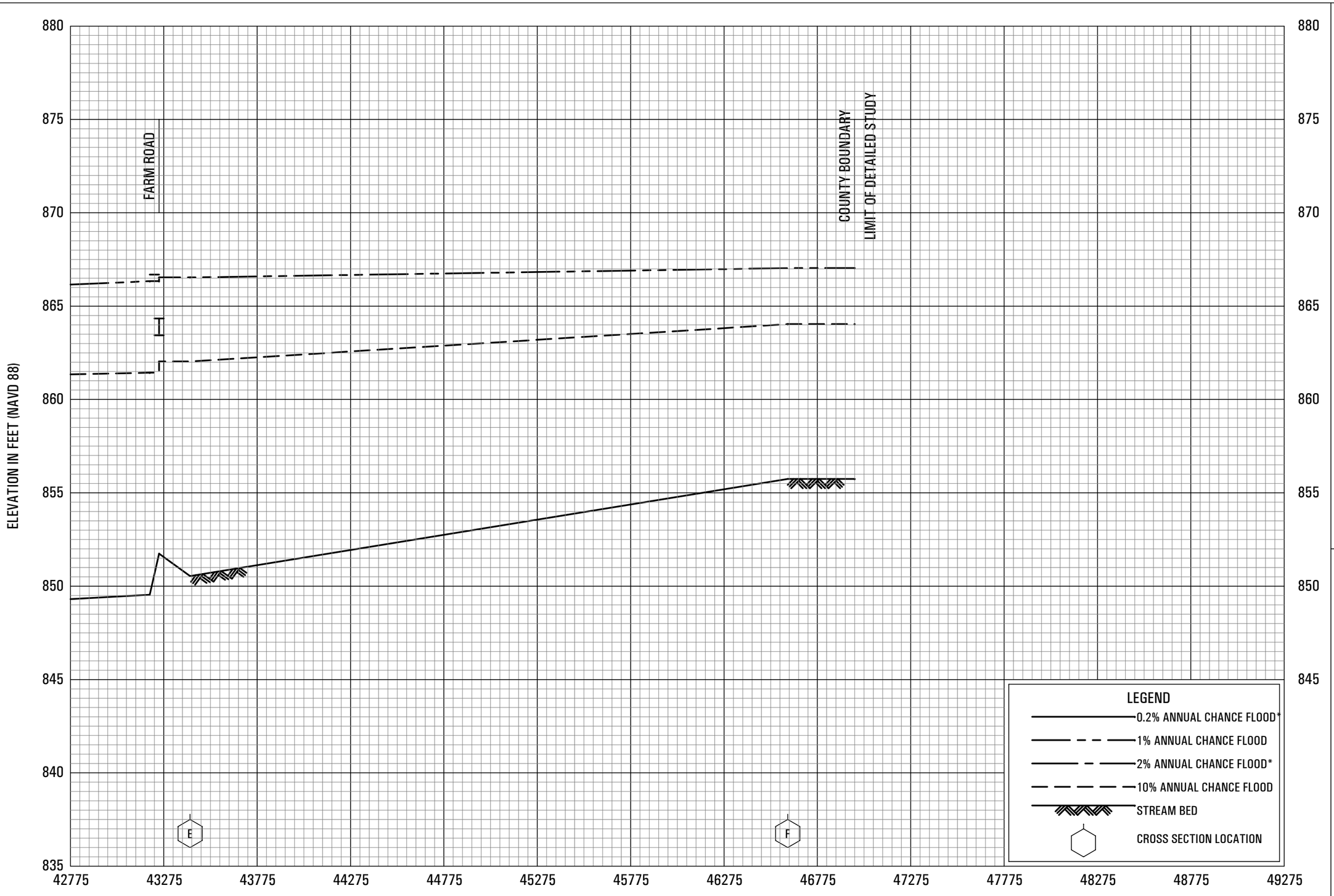
FLOOD PROFILES

LITTLE CEDAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



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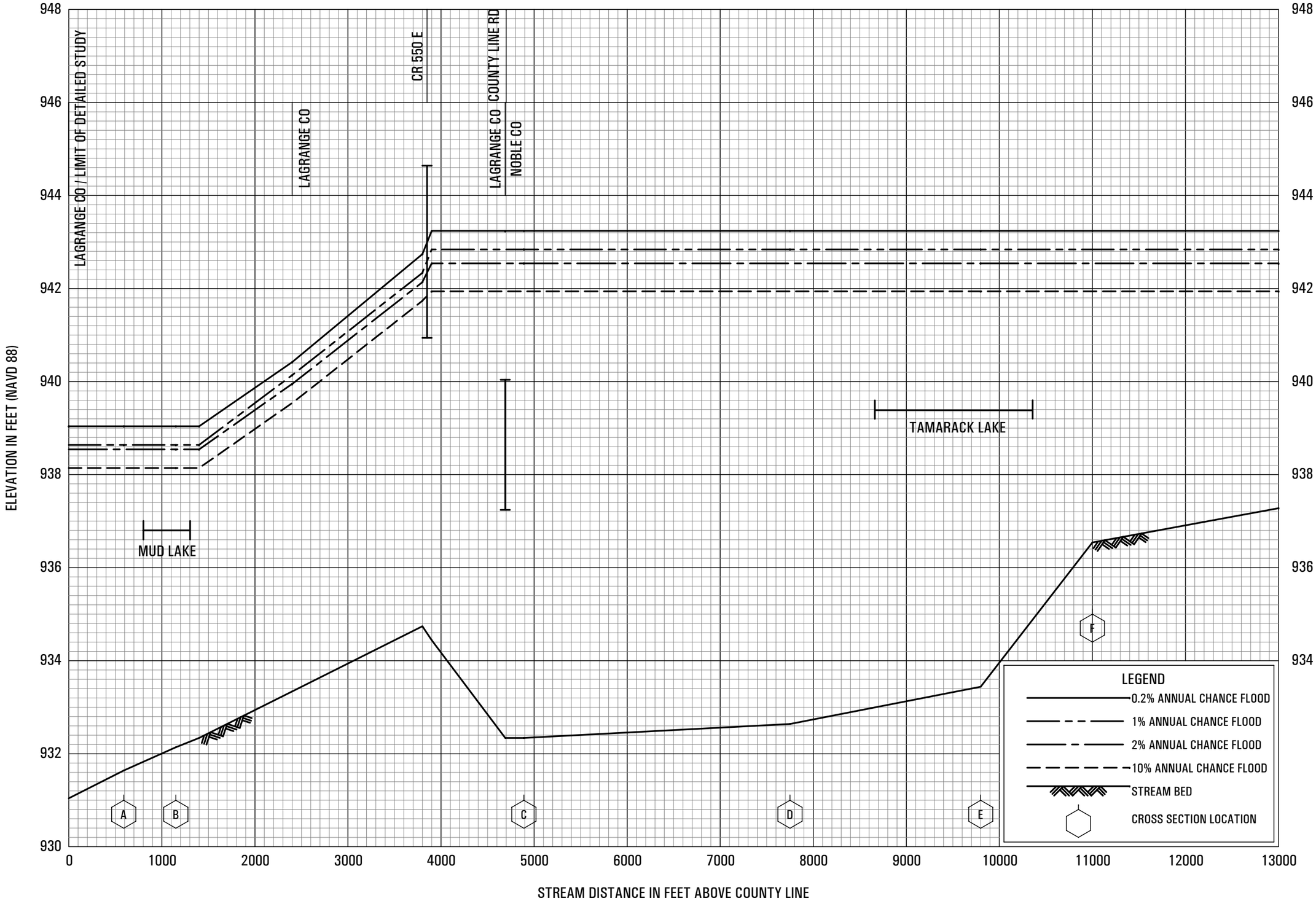
FLOOD PROFILES

LITTLE CEDAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

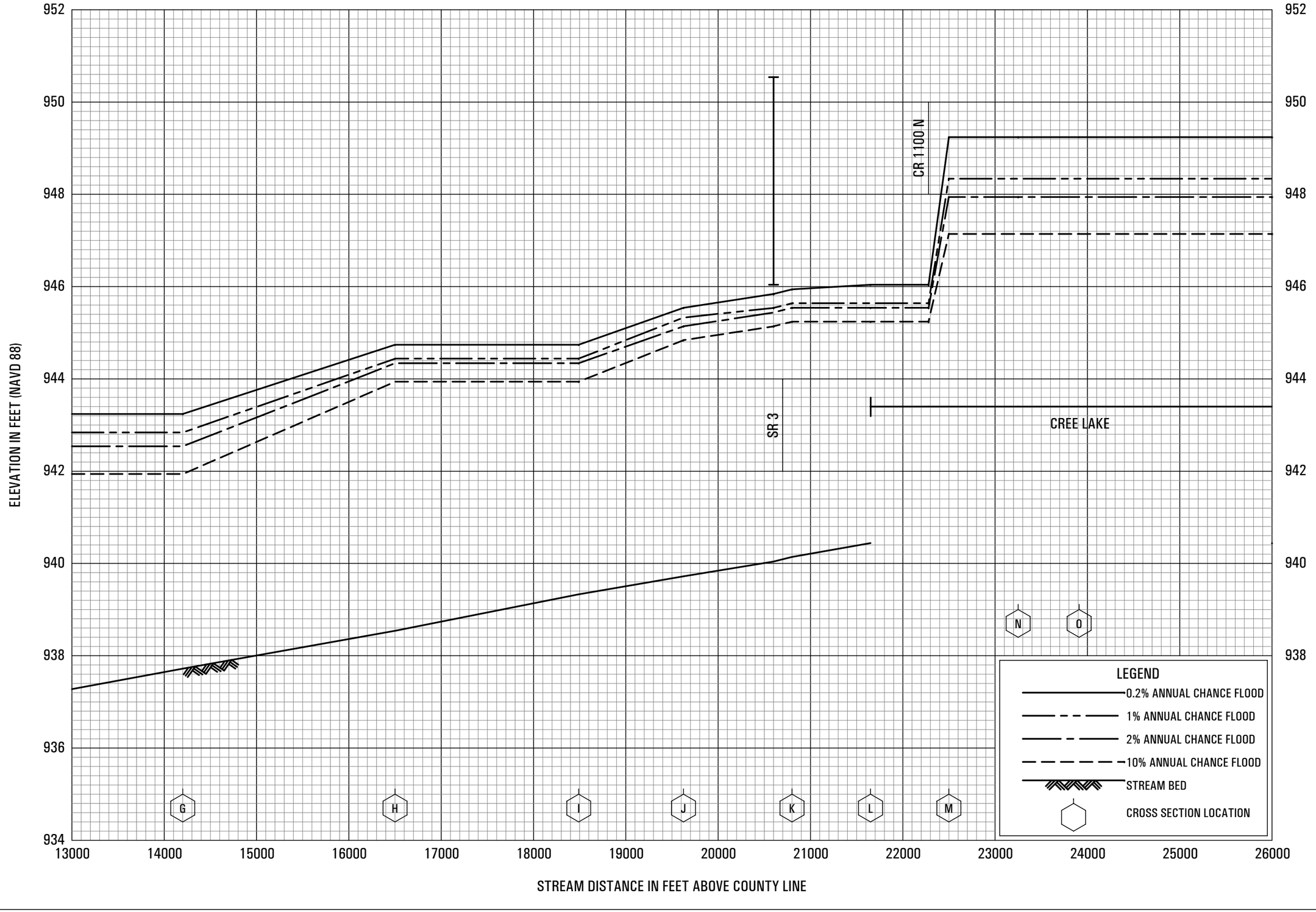
LITTLE ELKHART CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

41P



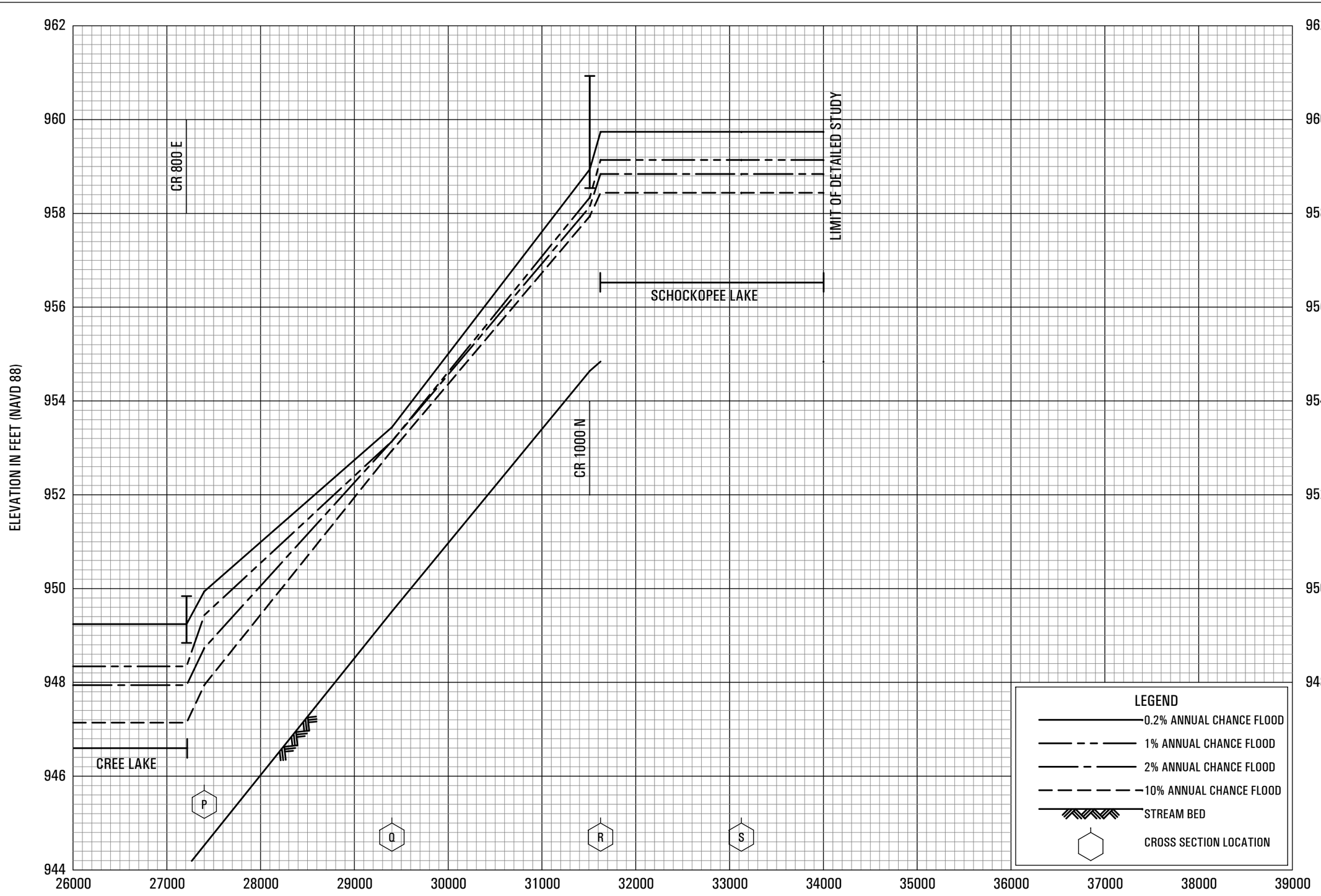
FLOOD PROFILES

LITTLE ELKHART CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



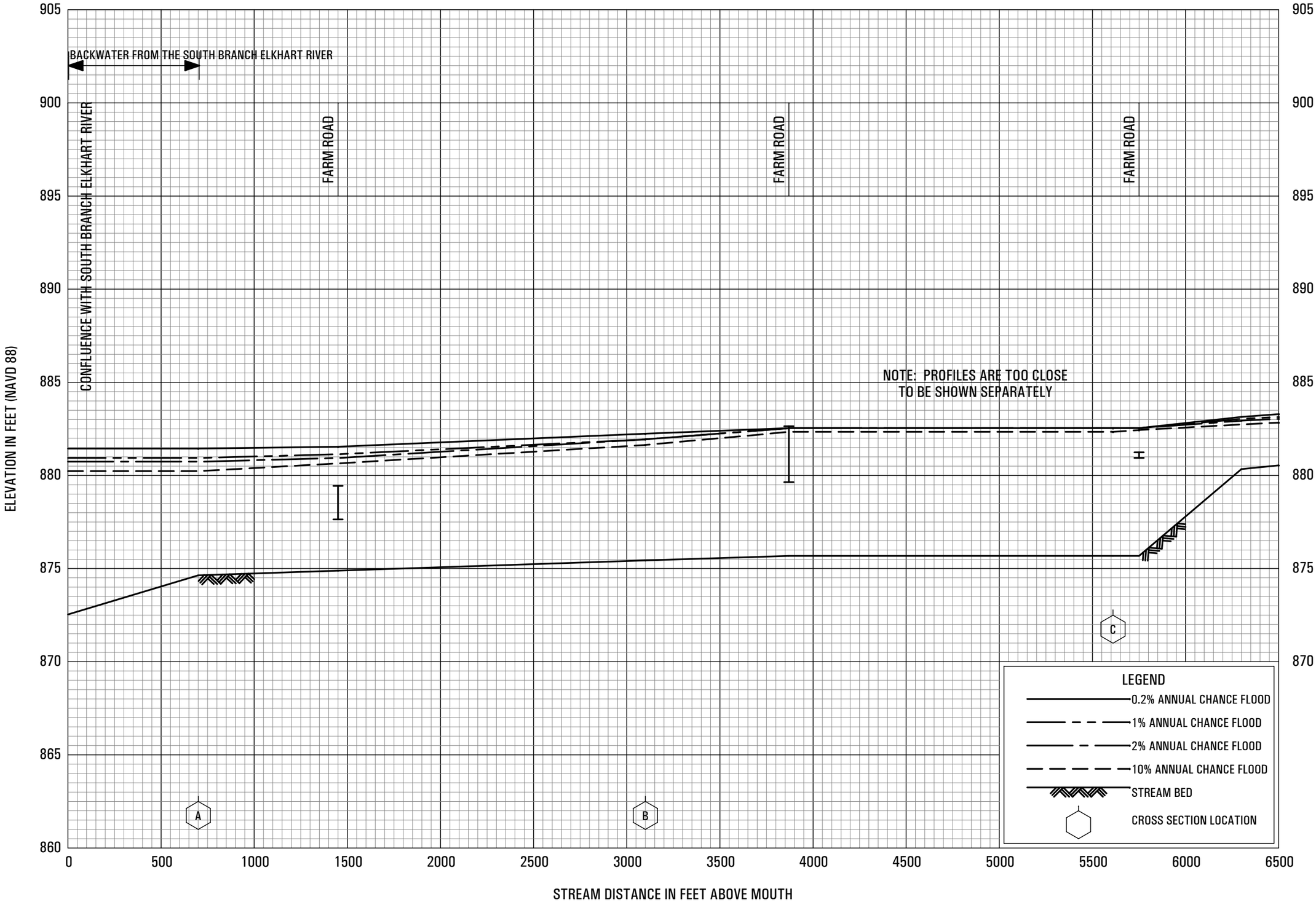
FLOOD PROFILES

LITTLE ELKHART CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

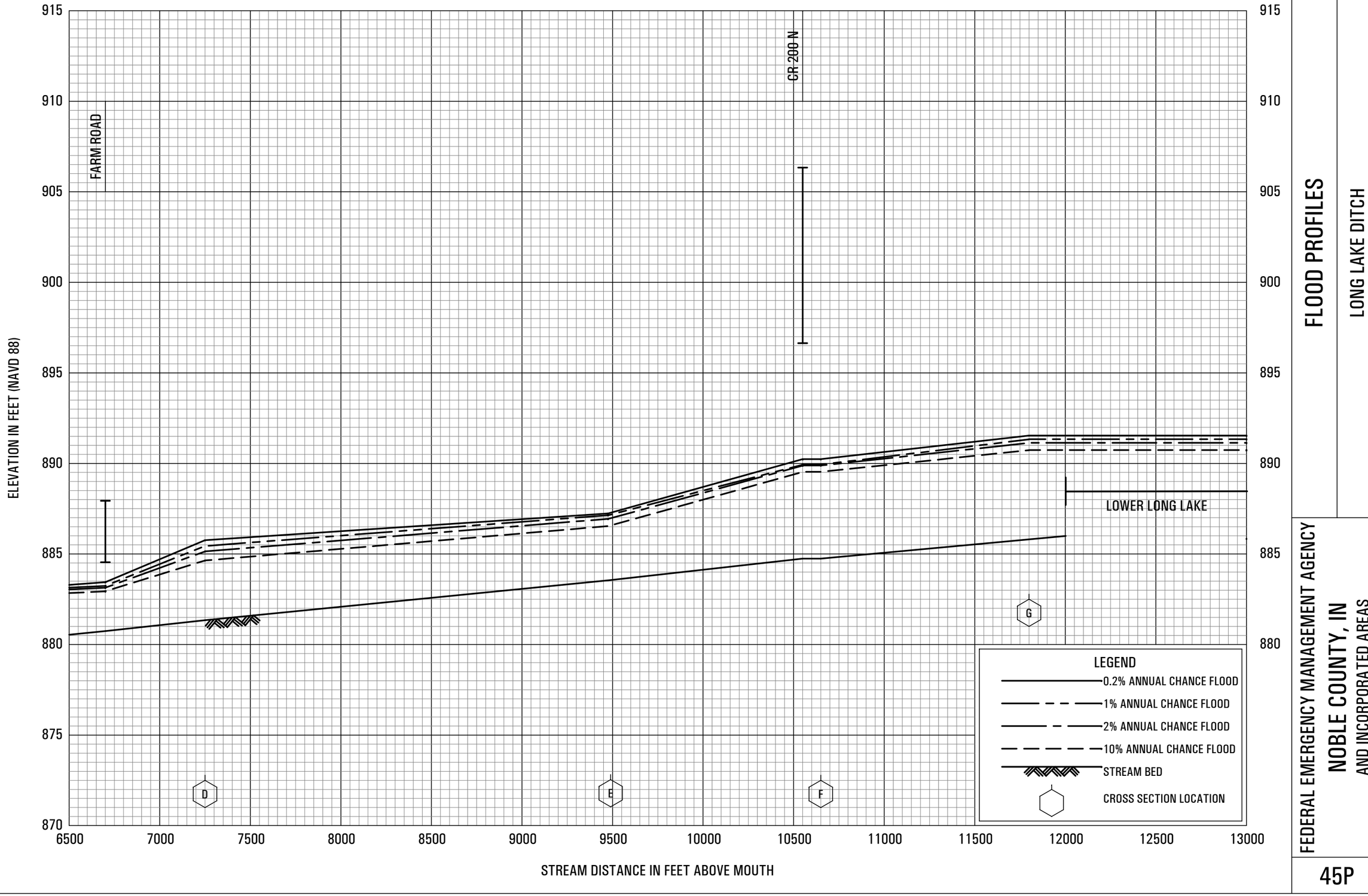
LONG LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

44P



FLOOD PROFILES

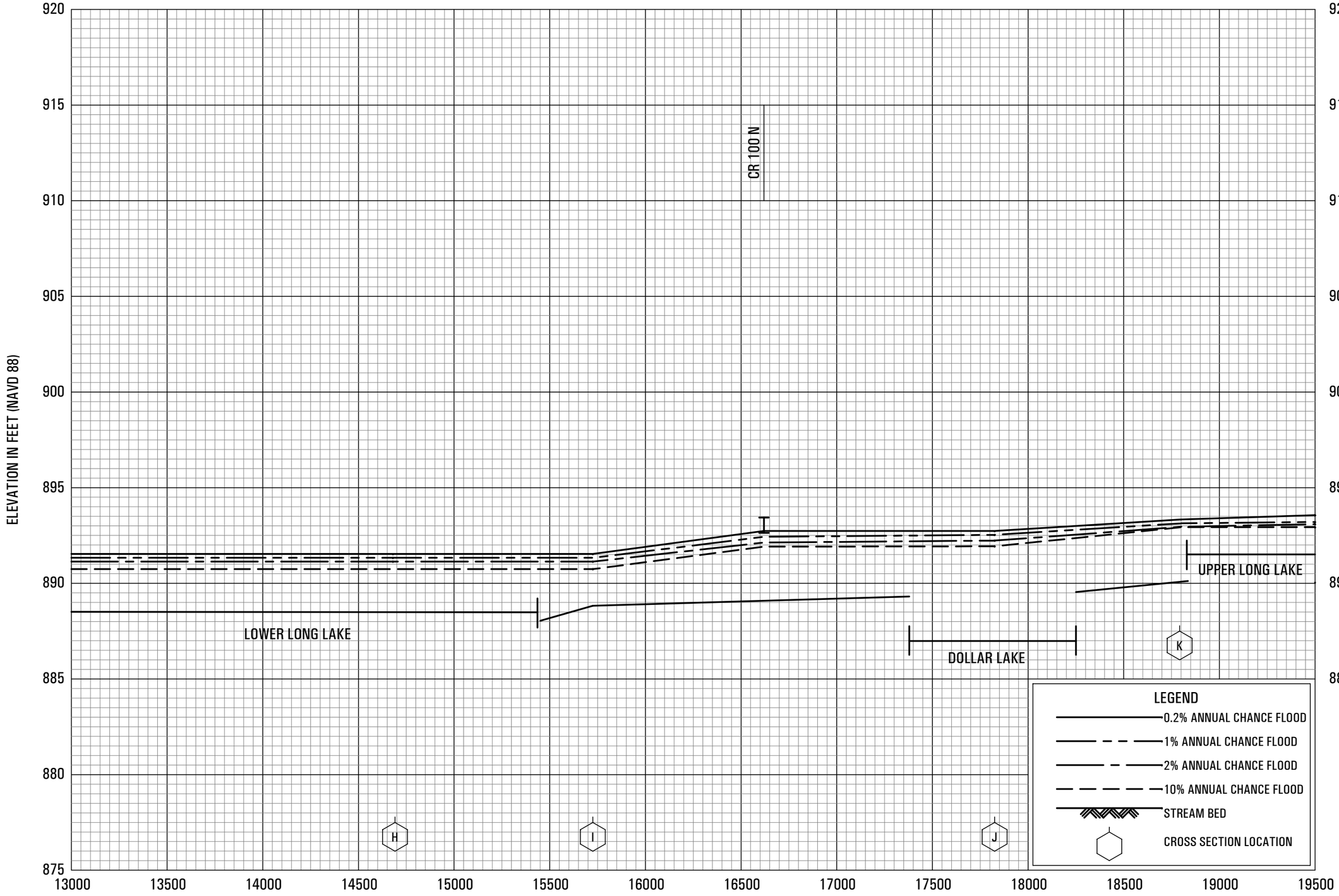
LONG LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

45P



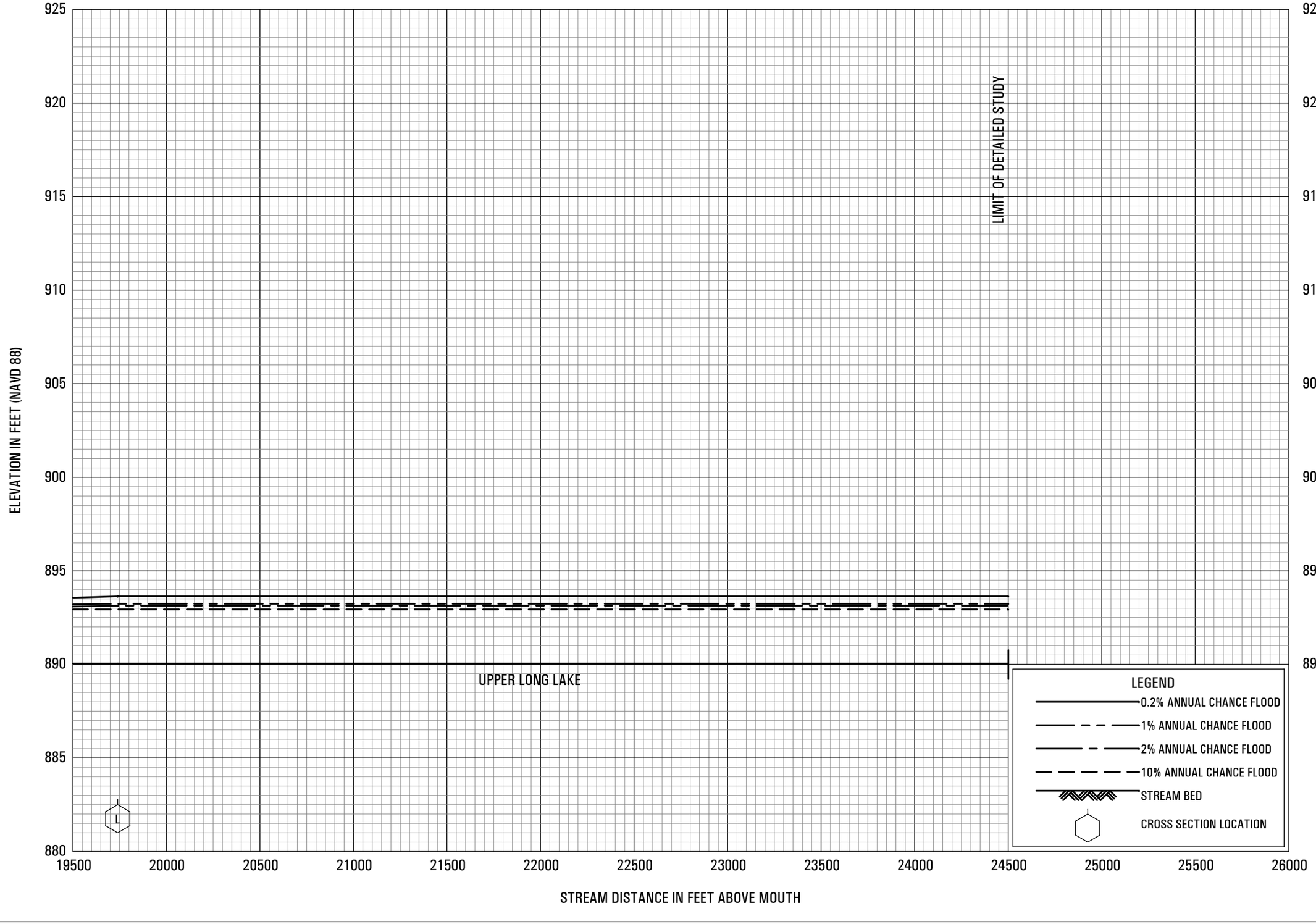
FLOOD PROFILES

LONG LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



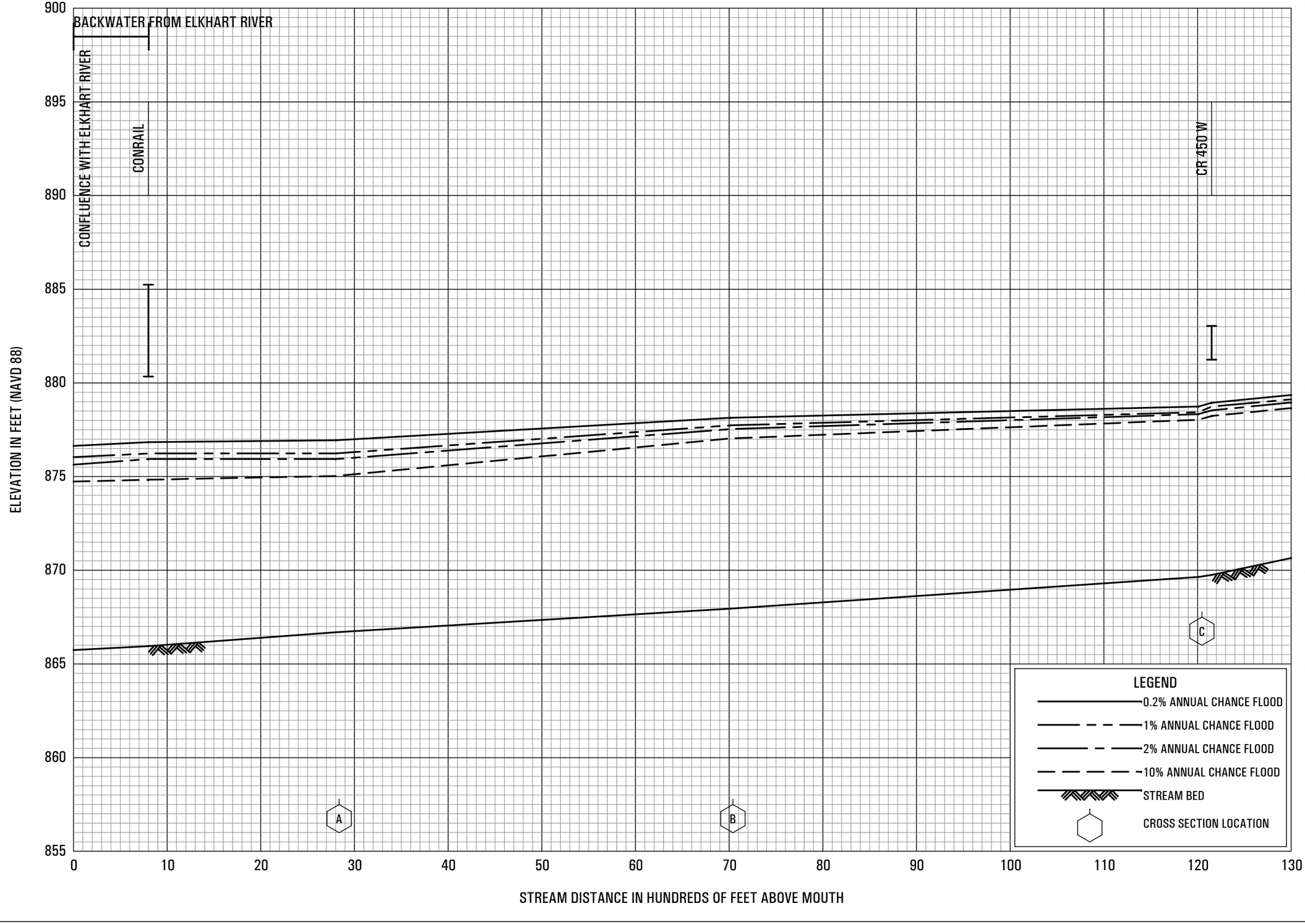
FLOOD PROFILES

LONG LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN
AND INCORPORATED AREAS

47P



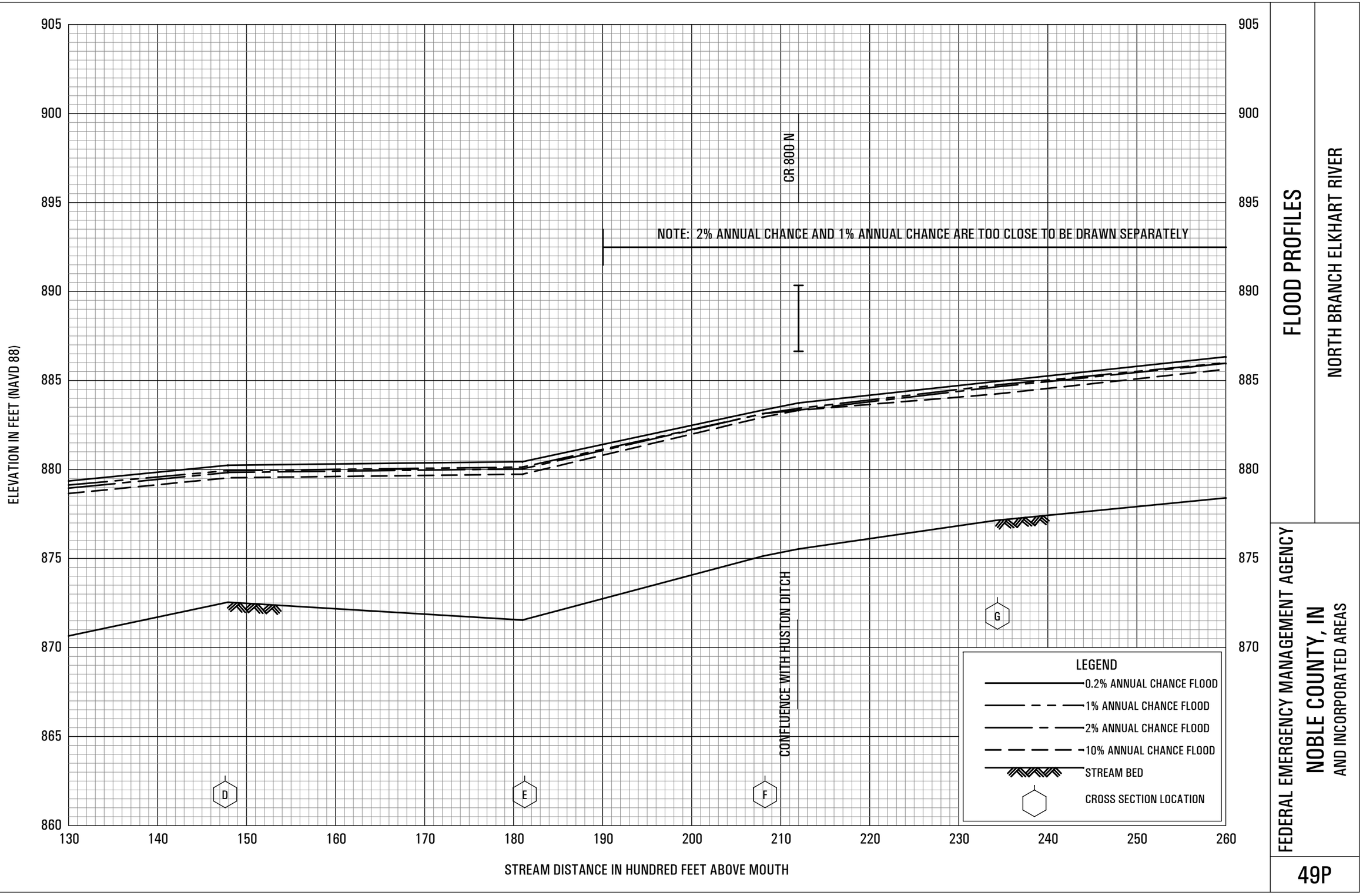
FLOOD PROFILES

NORTH BRANCH ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN
AND INCORPORATED AREAS

48P



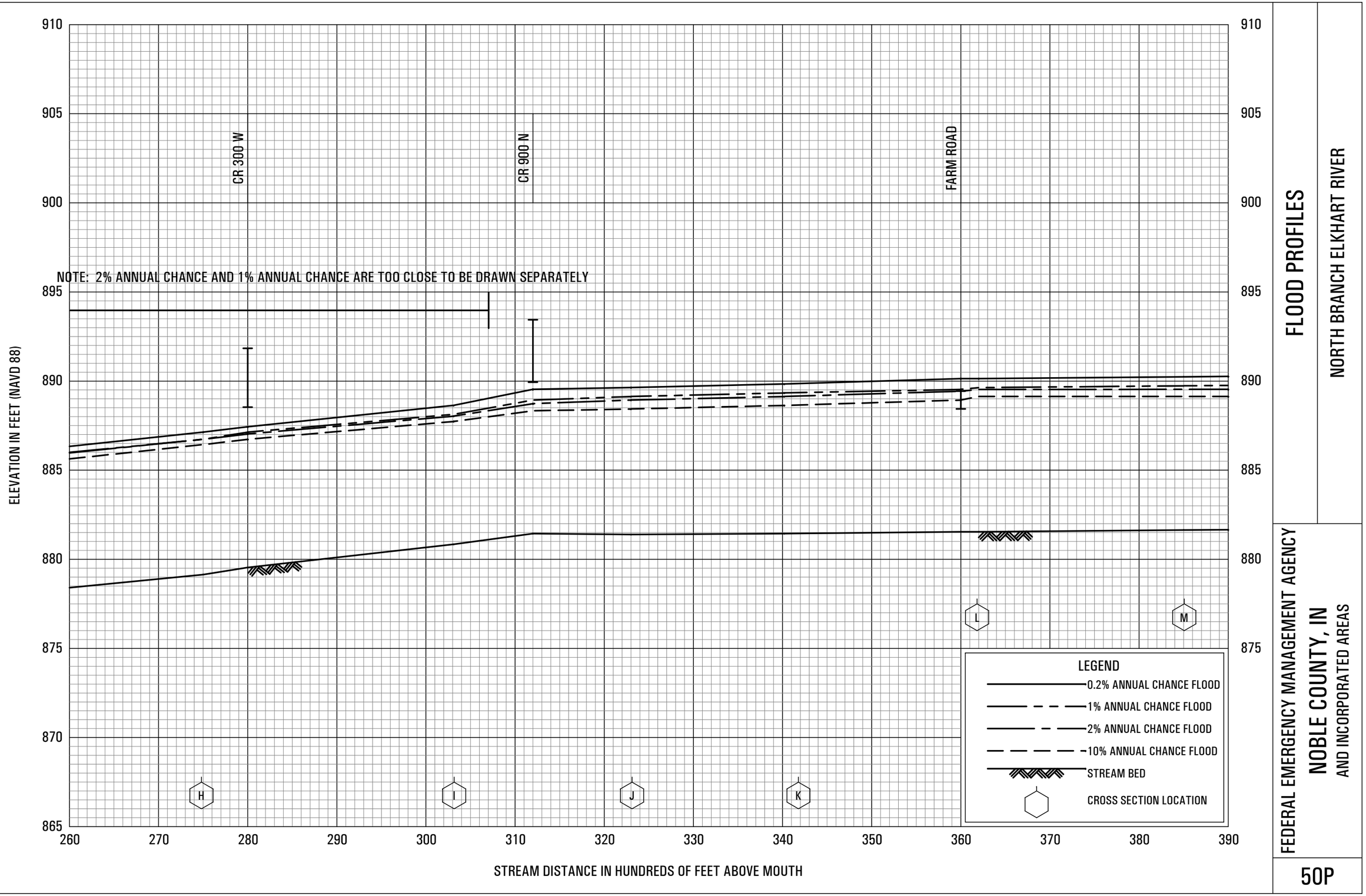
FLOOD PROFILES

NORTH BRANCH ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



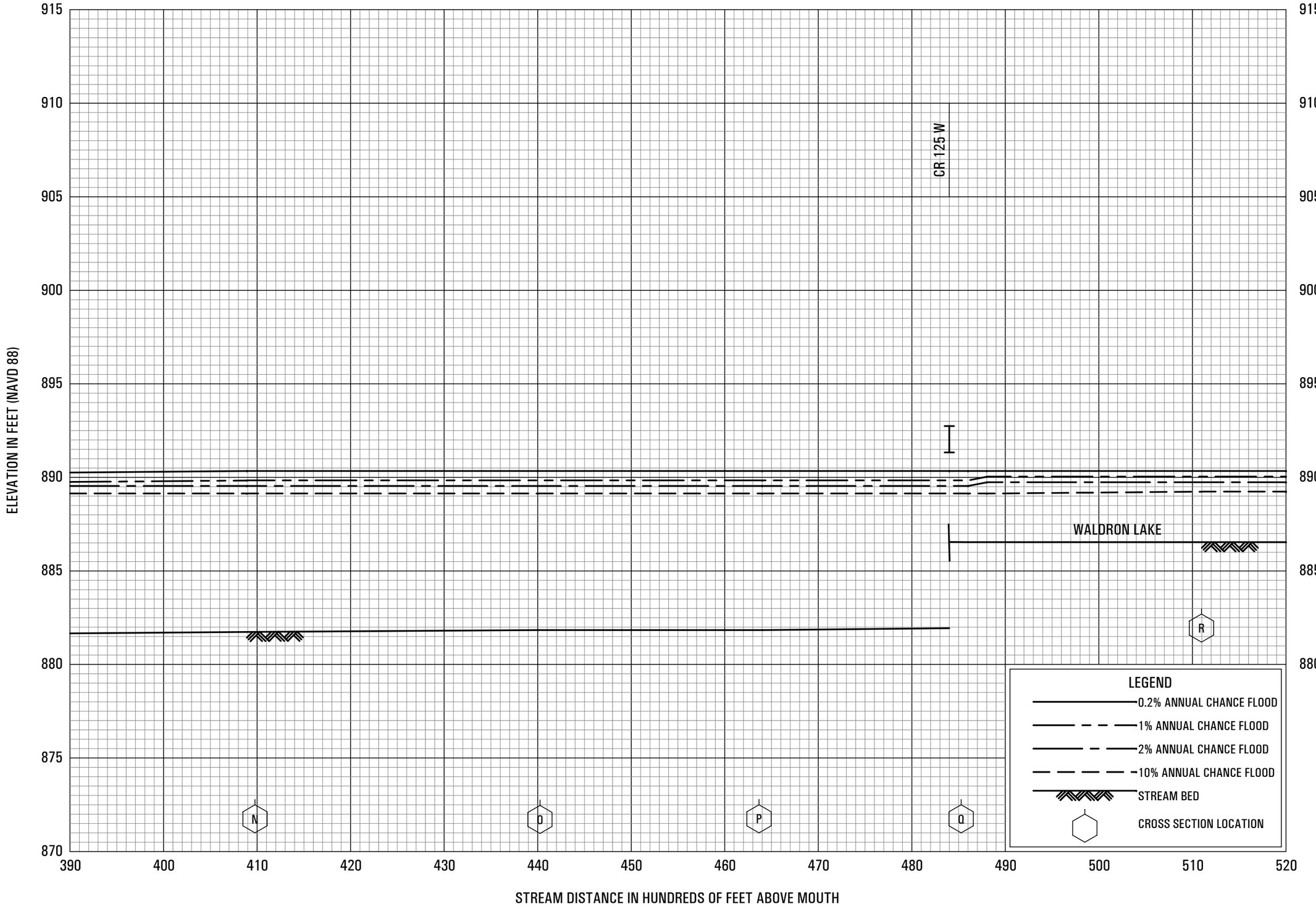
FLOOD PROFILES

NORTH BRANCH ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN
AND INCORPORATED AREAS

50P



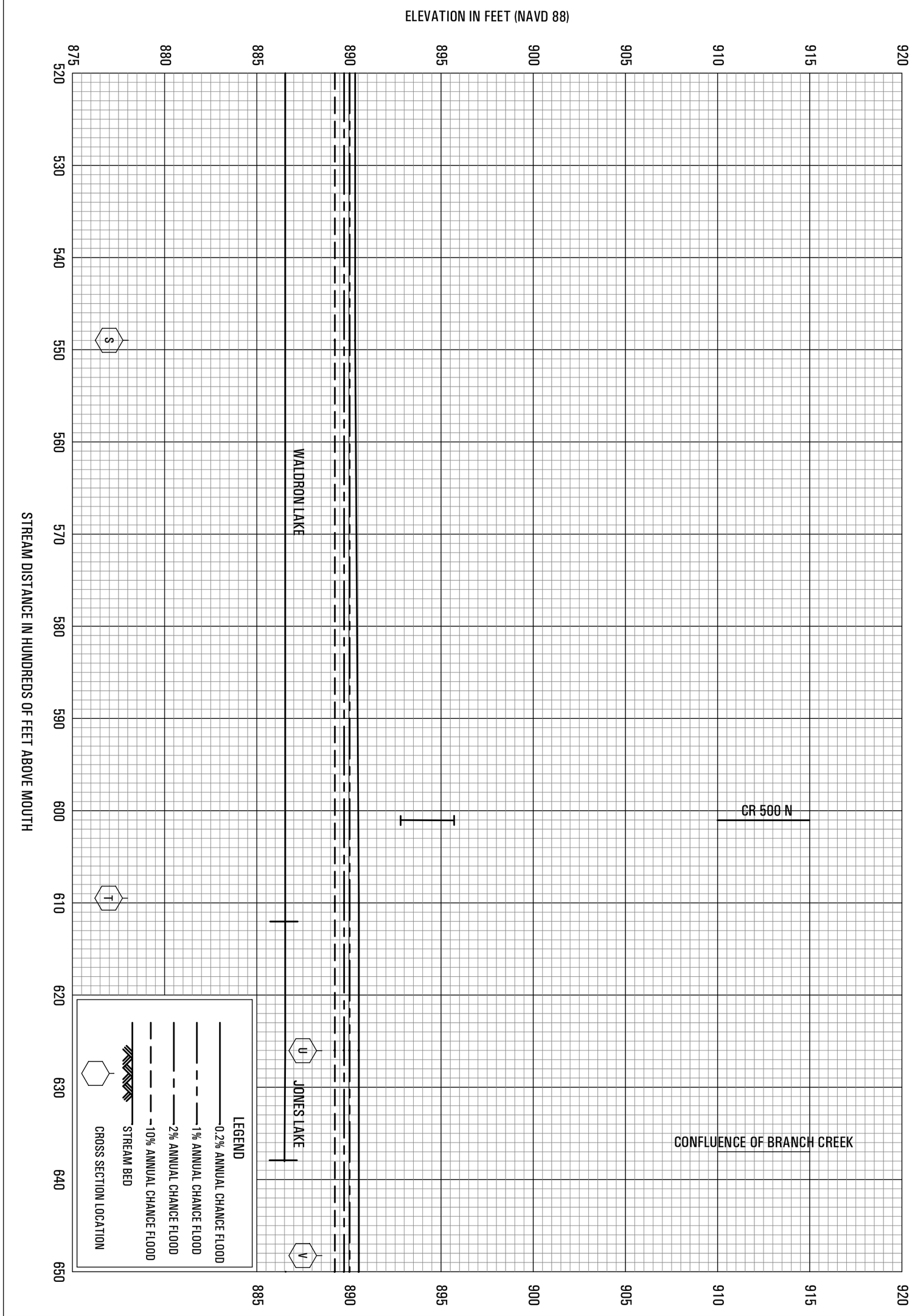
FLOOD PROFILES

NORTH BRANCH ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN
AND INCORPORATED AREAS

51P



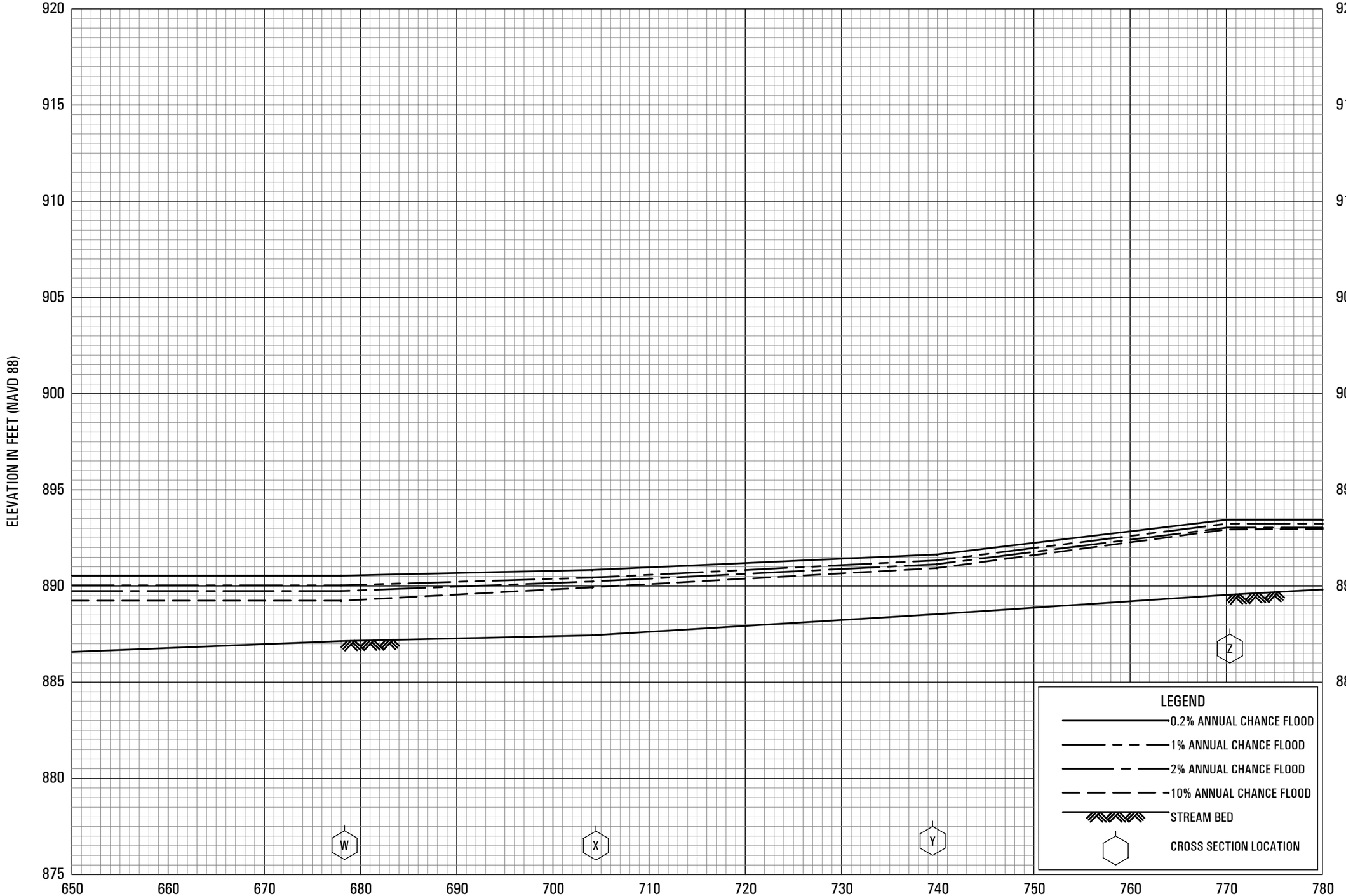
FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

FLOOD PROFILES

NORTH BRANCH ELKHART RIVER



FLOOD PROFILES

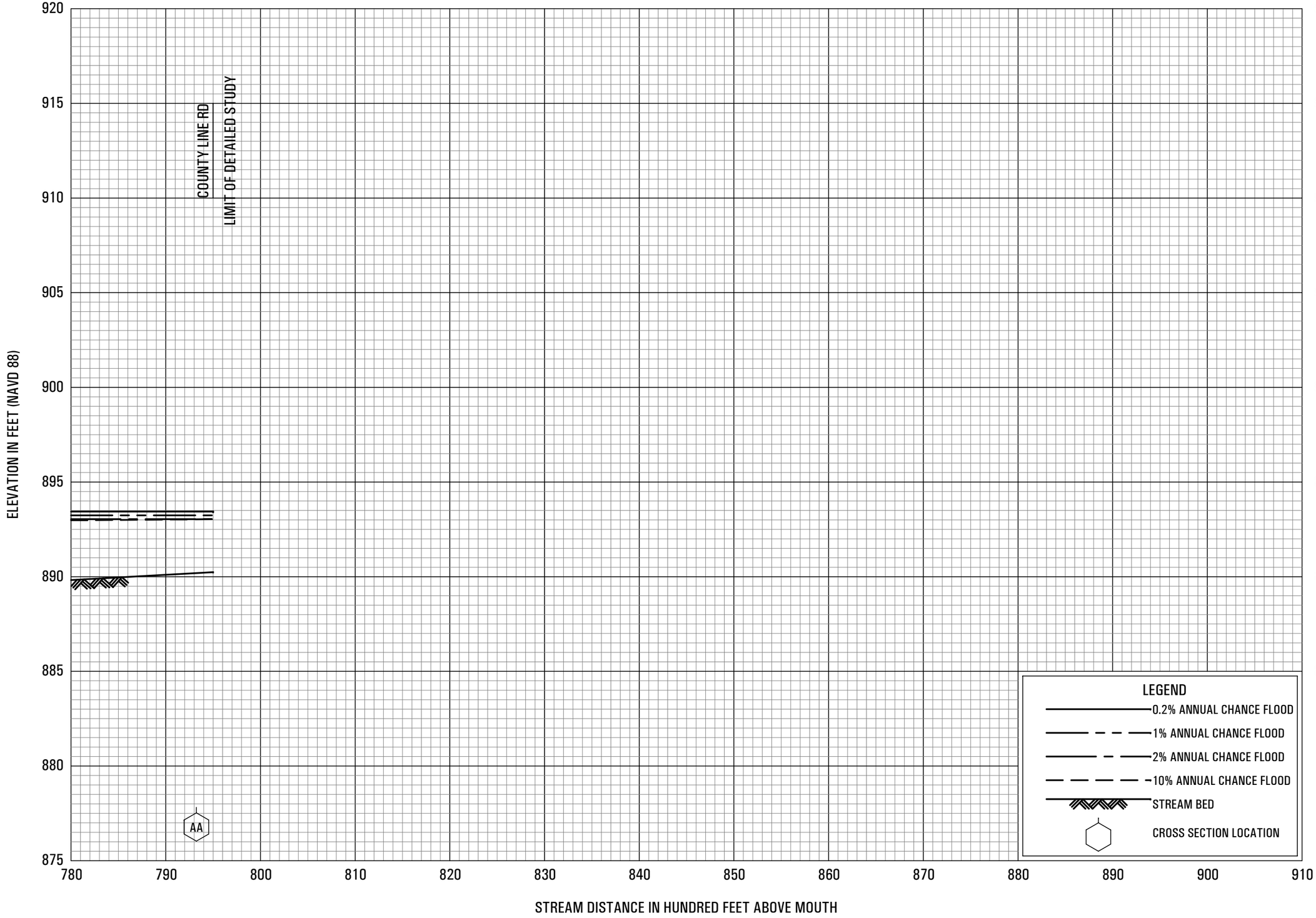
NORTH BRANCH ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

53P



FLOOD PROFILES

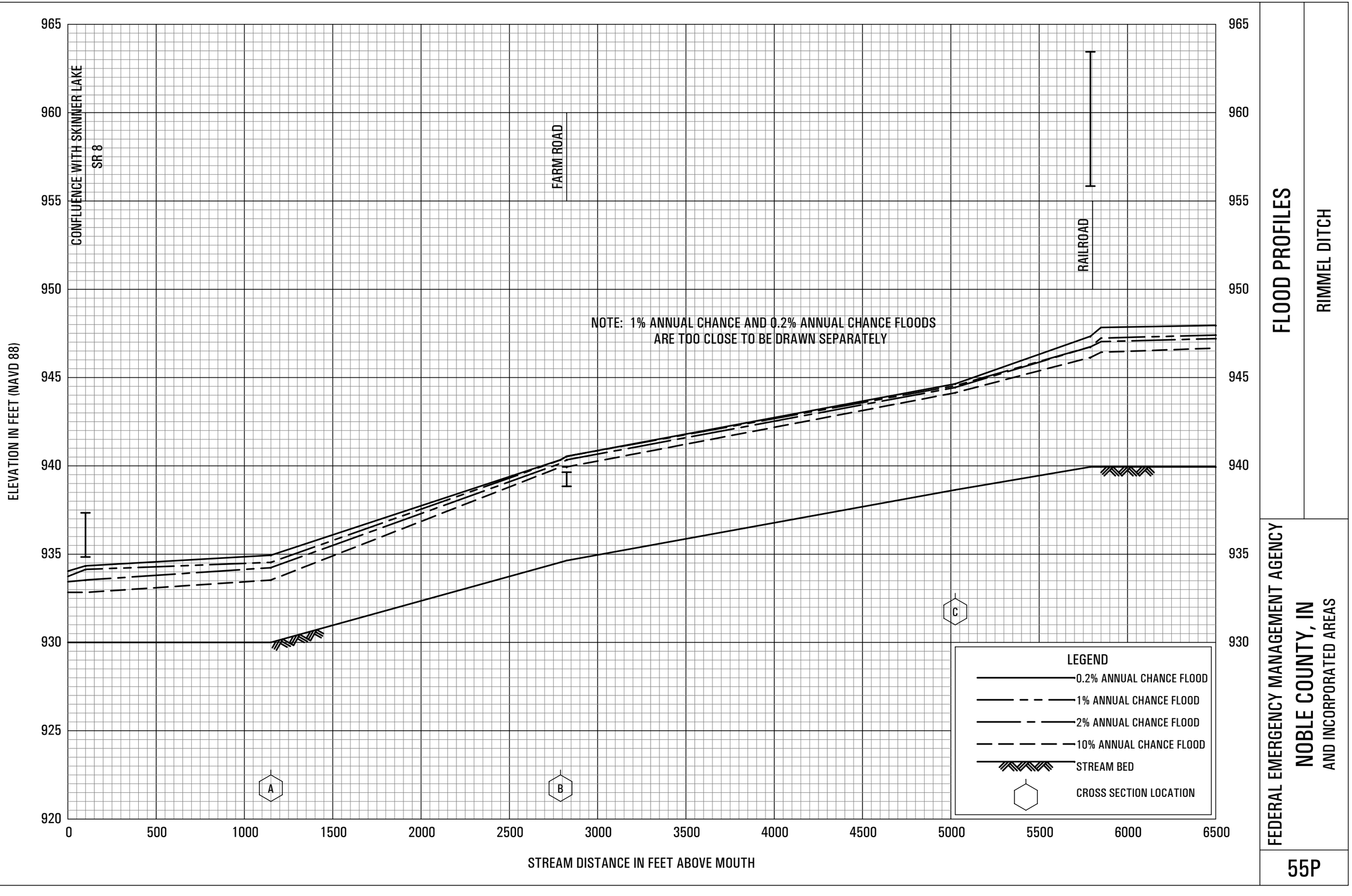
NORTH BRANCH ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

54P



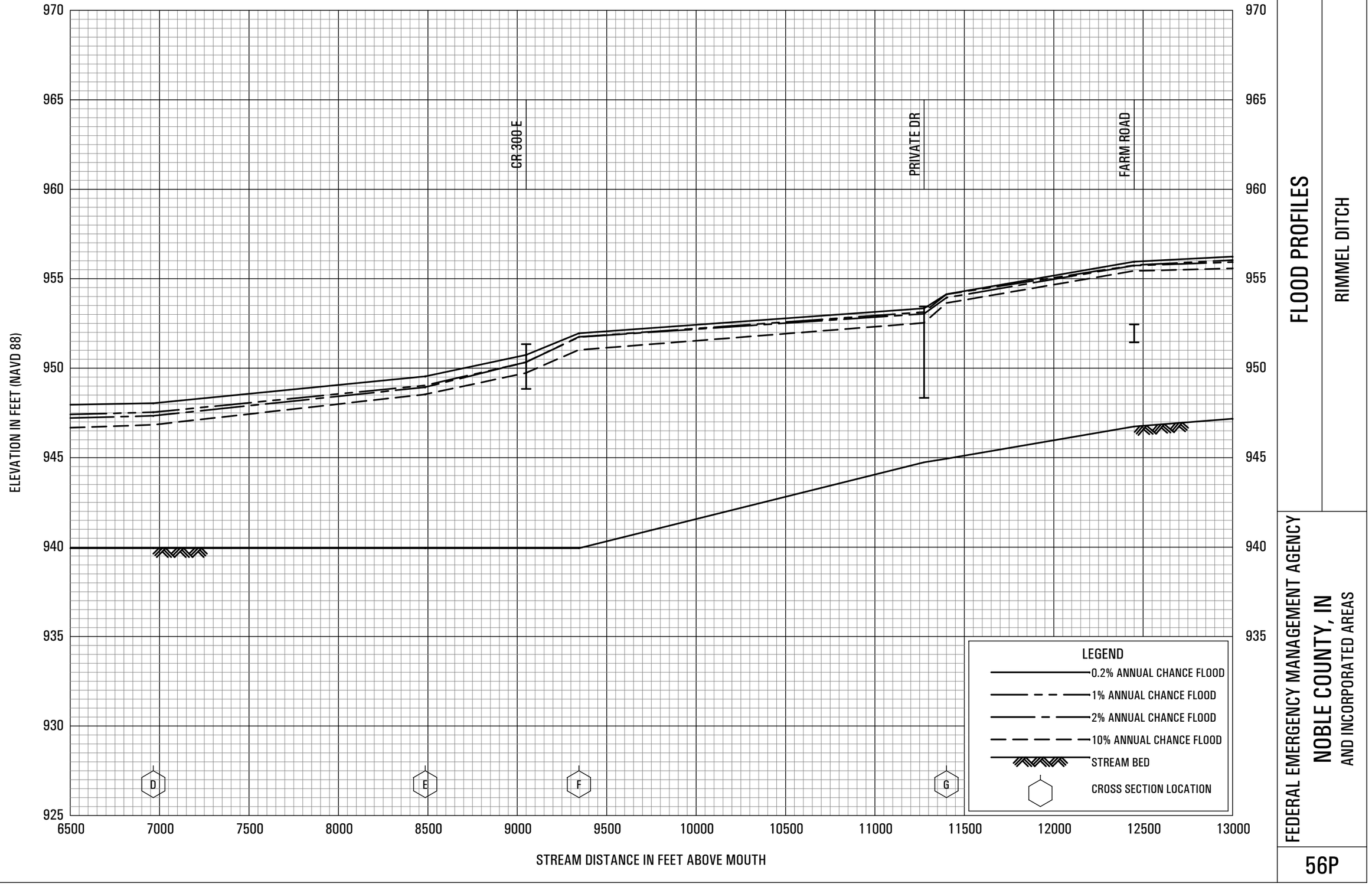
FLOOD PROFILES

RIMMEL DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN
AND INCORPORATED AREAS

55P



FLOOD PROFILES

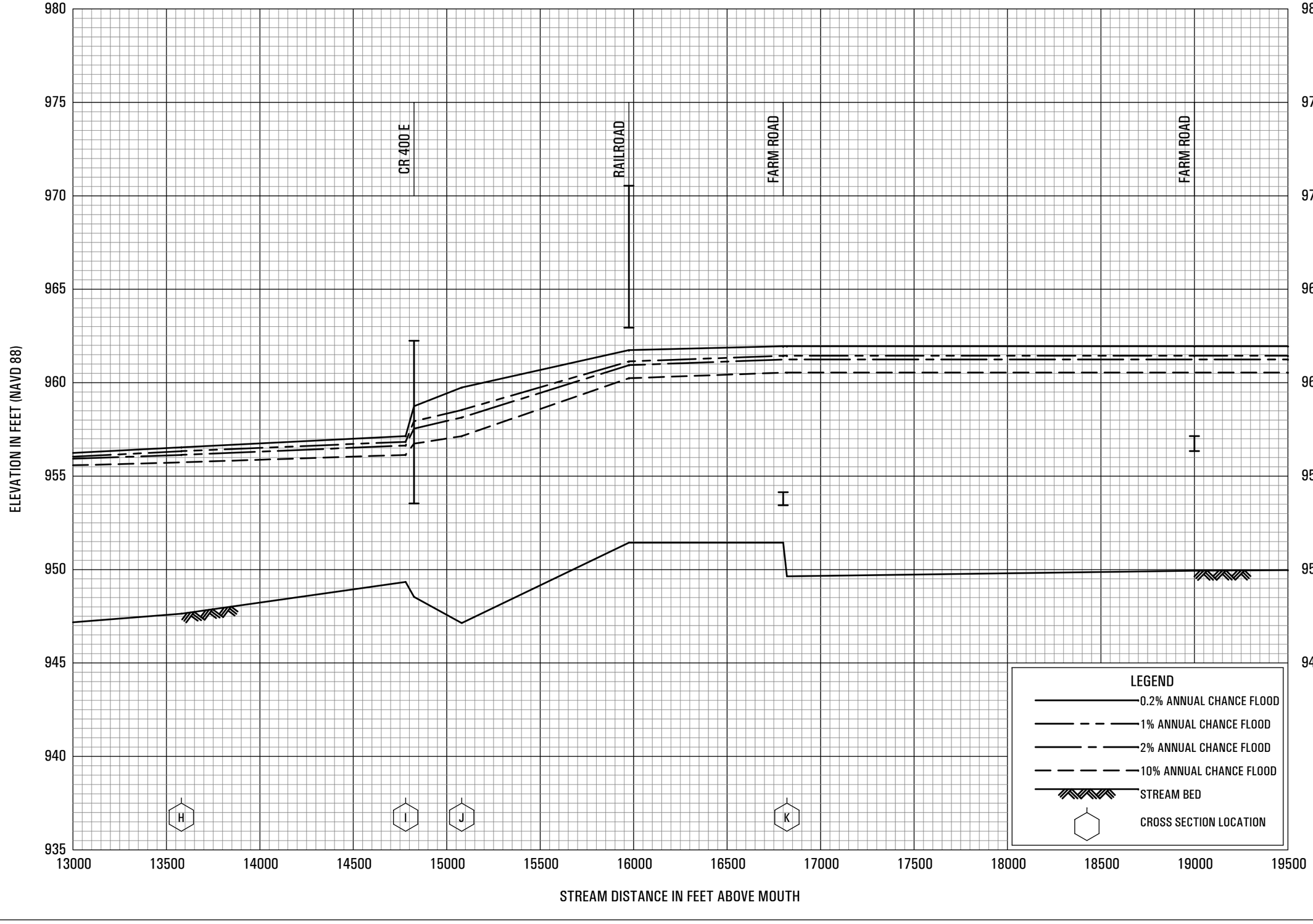
RIMMEL DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

56P



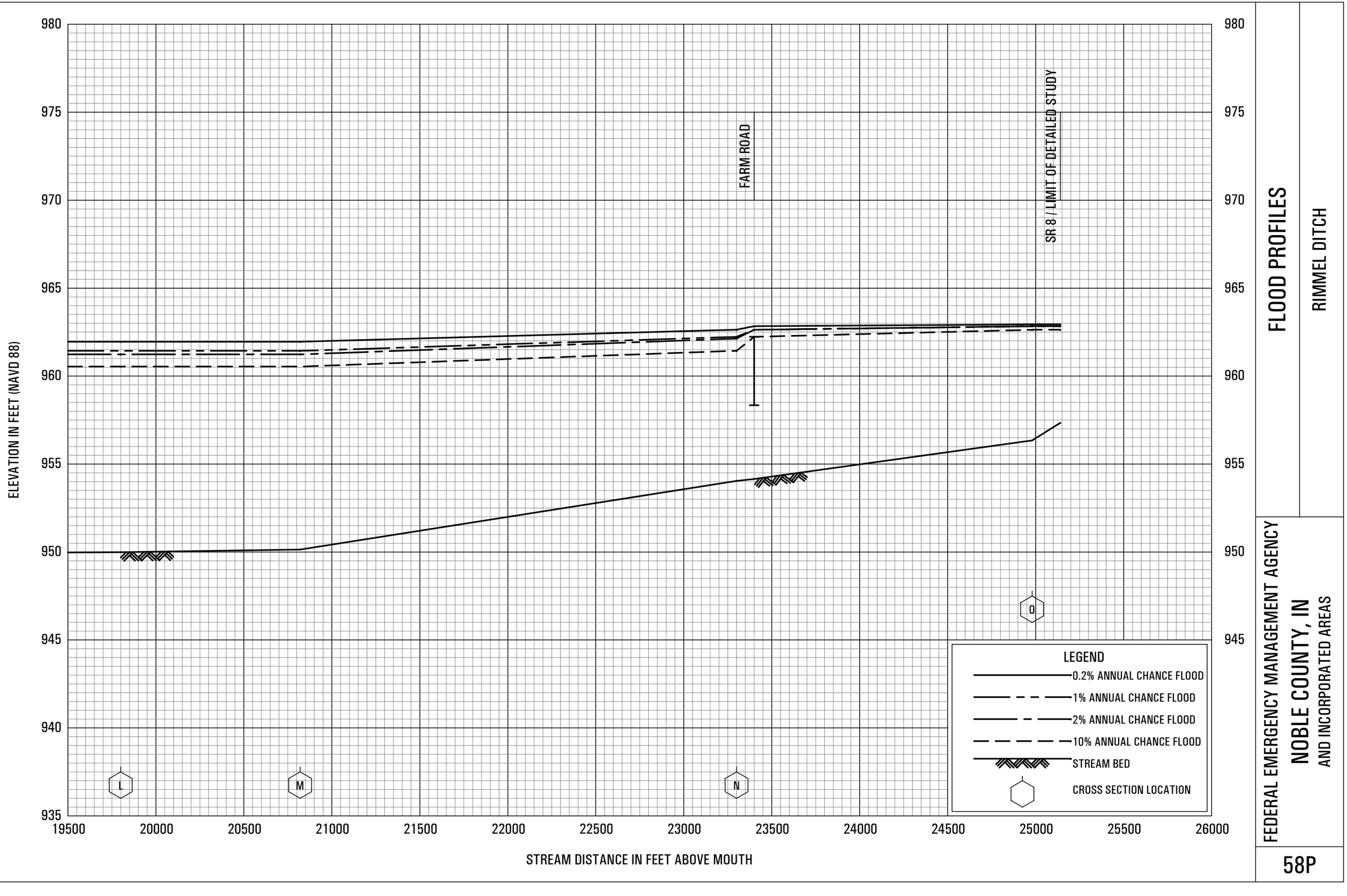
FLOOD PROFILES

RIMMEL DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

RIMMEL DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

58P

ELKHART CO / LIMIT OF DETAILED STUDY

ELEVATION IN FEET (NAVD 88)

895
890
885
880
875
870
865
860
855
850

43400 43900 44400 44900 45400 45900 46400 46900 47400 47900 48400 48900 49400 49900

STREAM DISTANCE IN FEET ABOVE MOUTH

A

B

LEGEND

- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

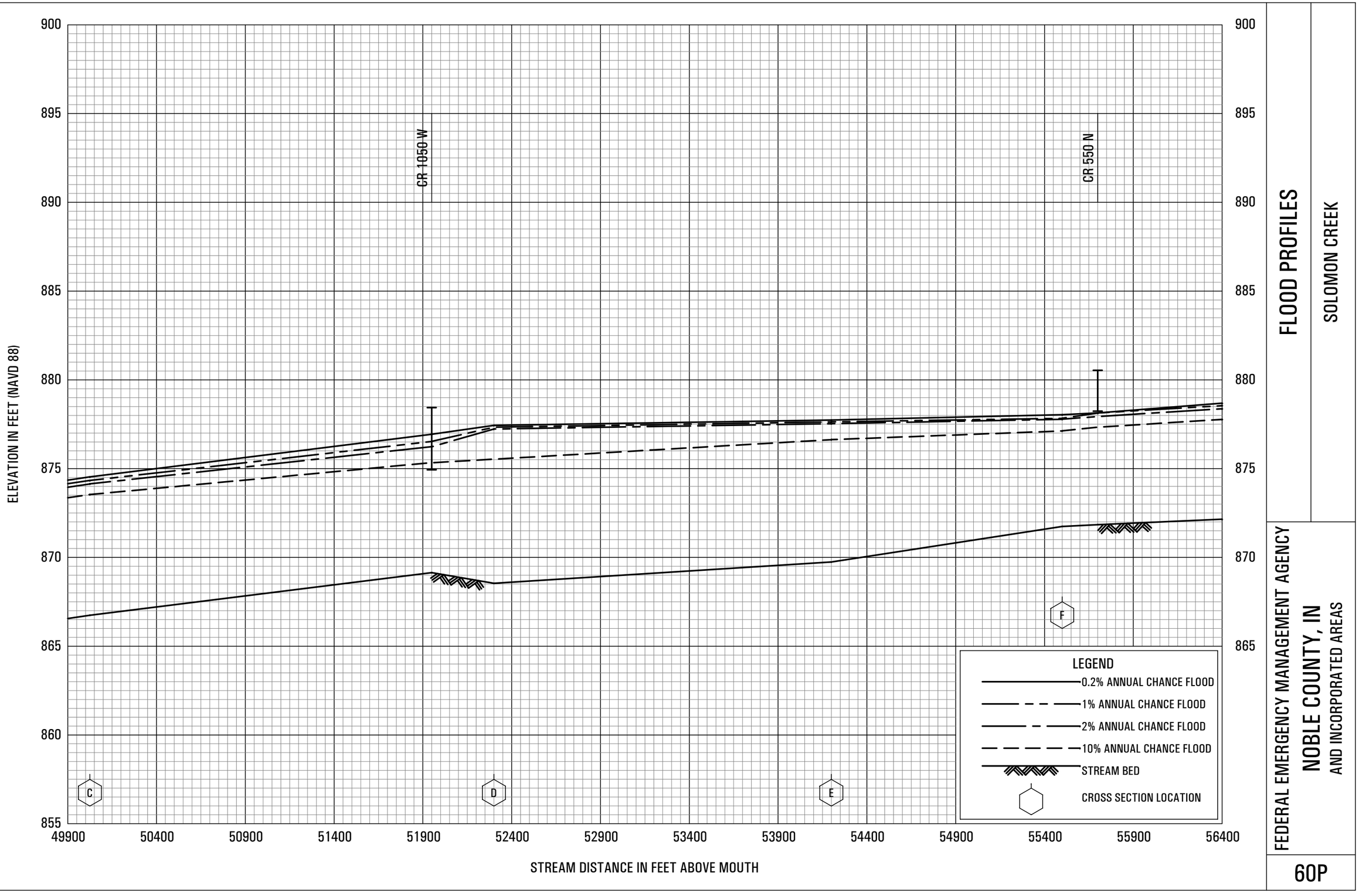
FLOOD PROFILES

SOLOMON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

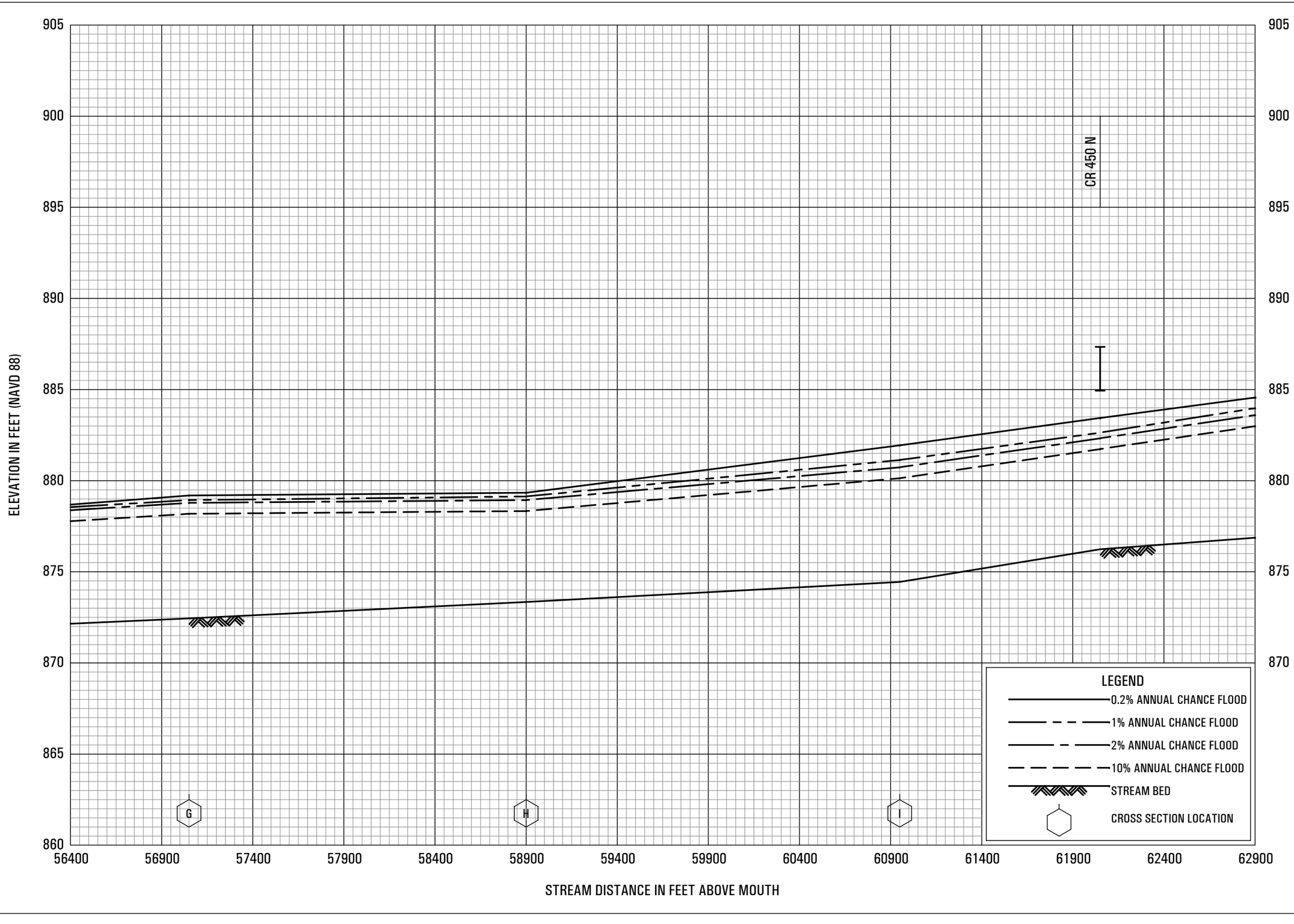
SOLOMON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

60P



FLOOD PROFILES

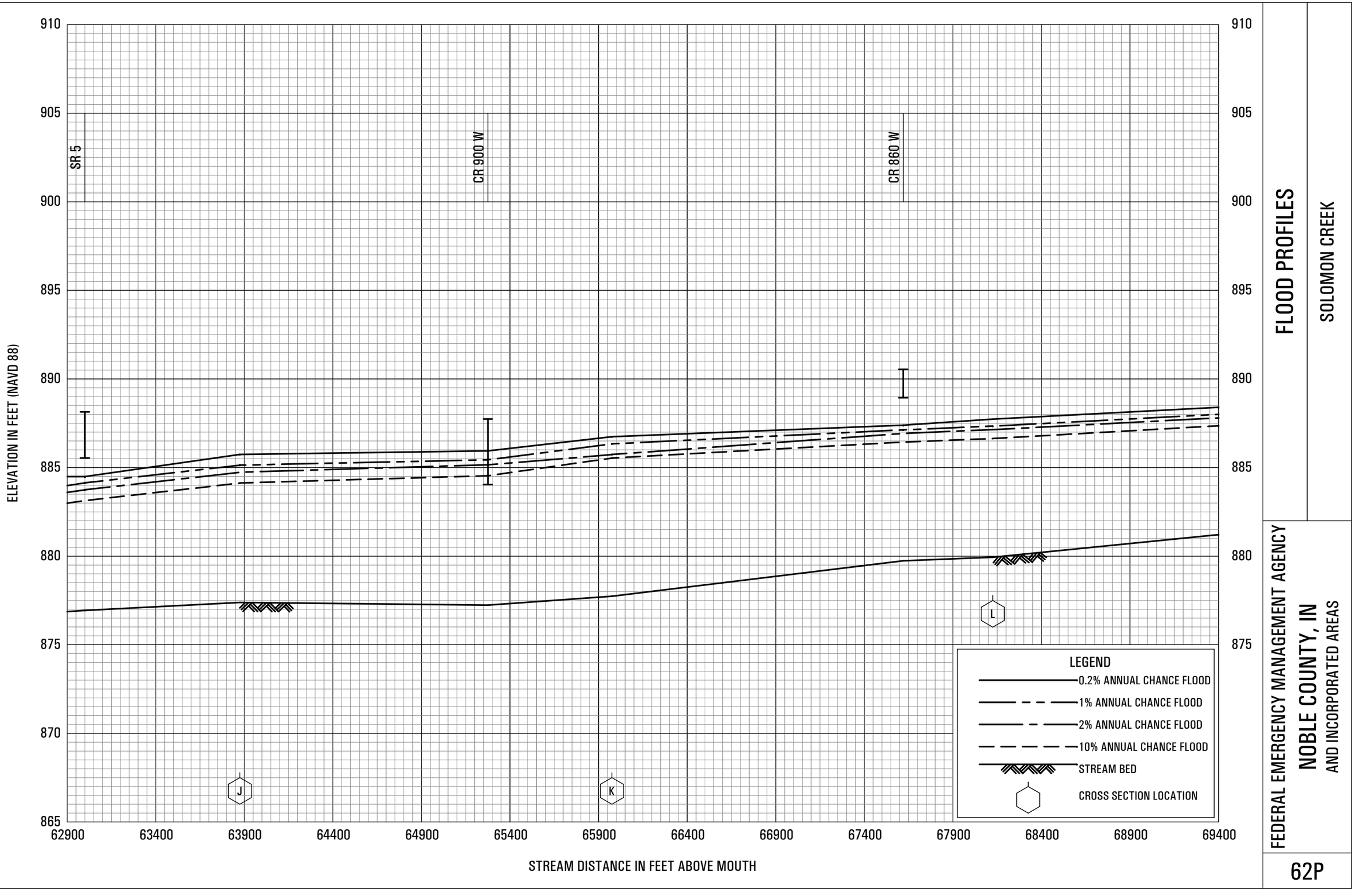
SOLOMON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

61P



FLOOD PROFILES

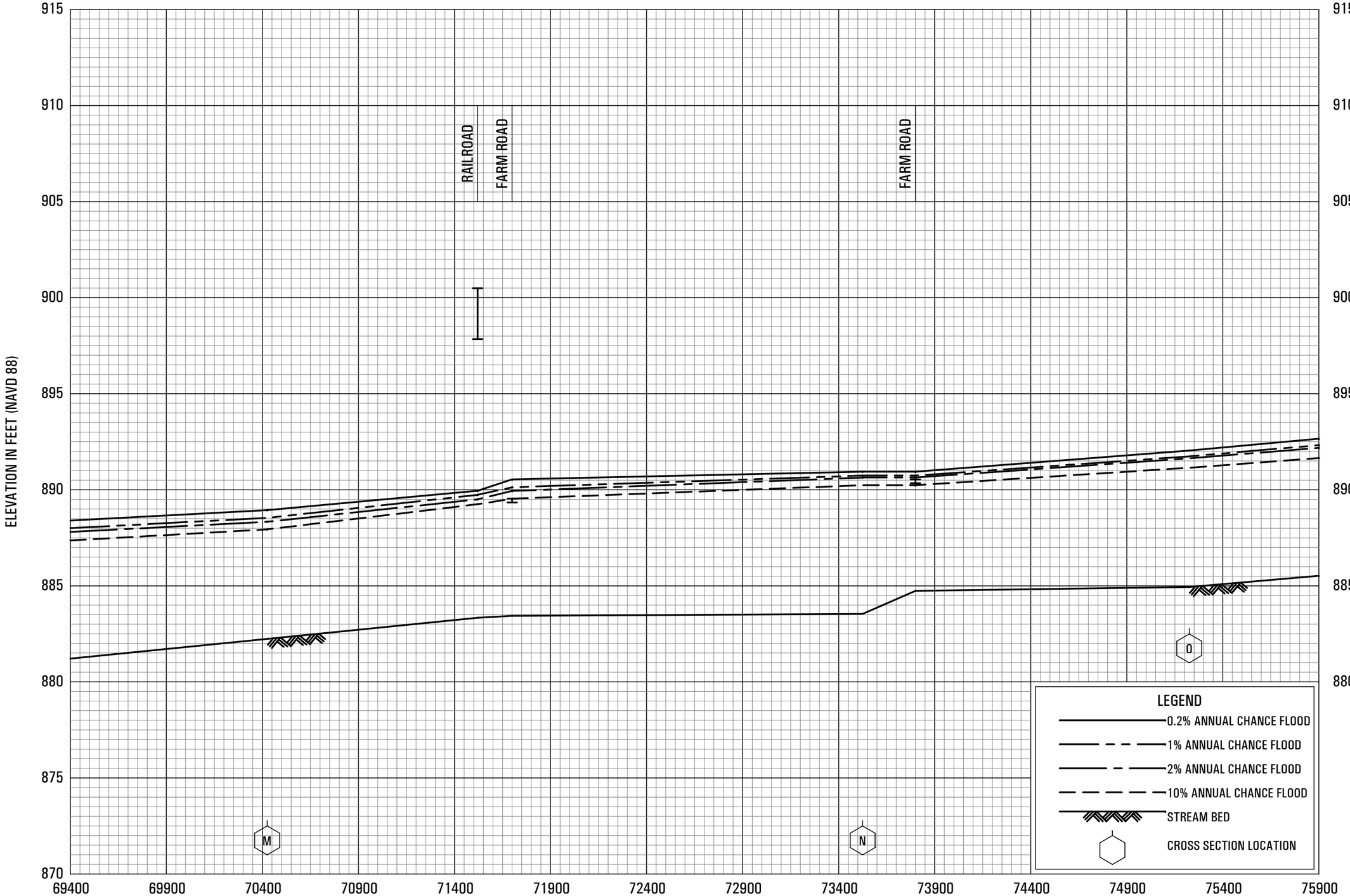
SOLOMON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

62P



FLOOD PROFILES

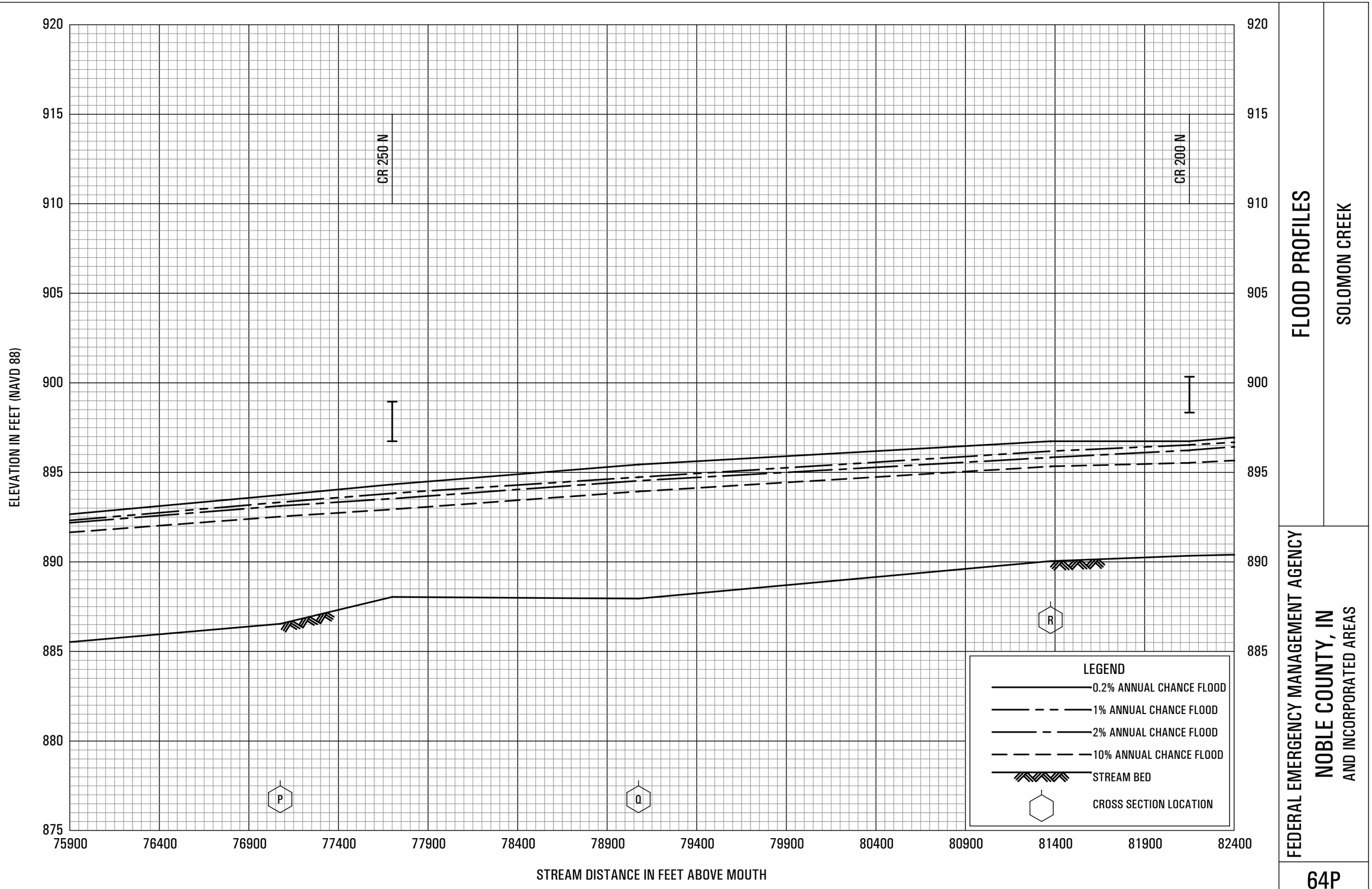
SOLOMON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

63P



FLOOD PROFILES

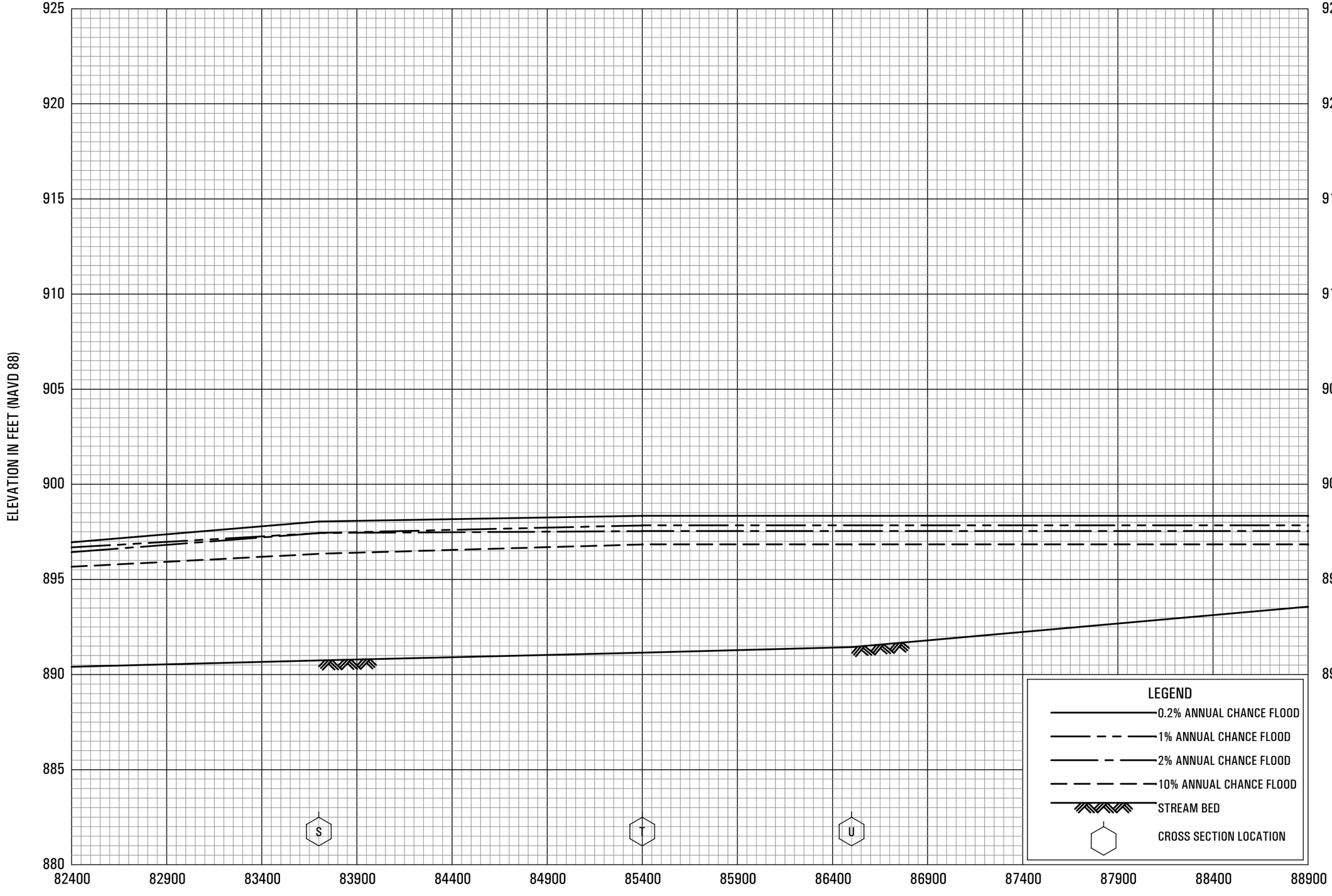
SOLOMON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

64P



FLOOD PROFILES

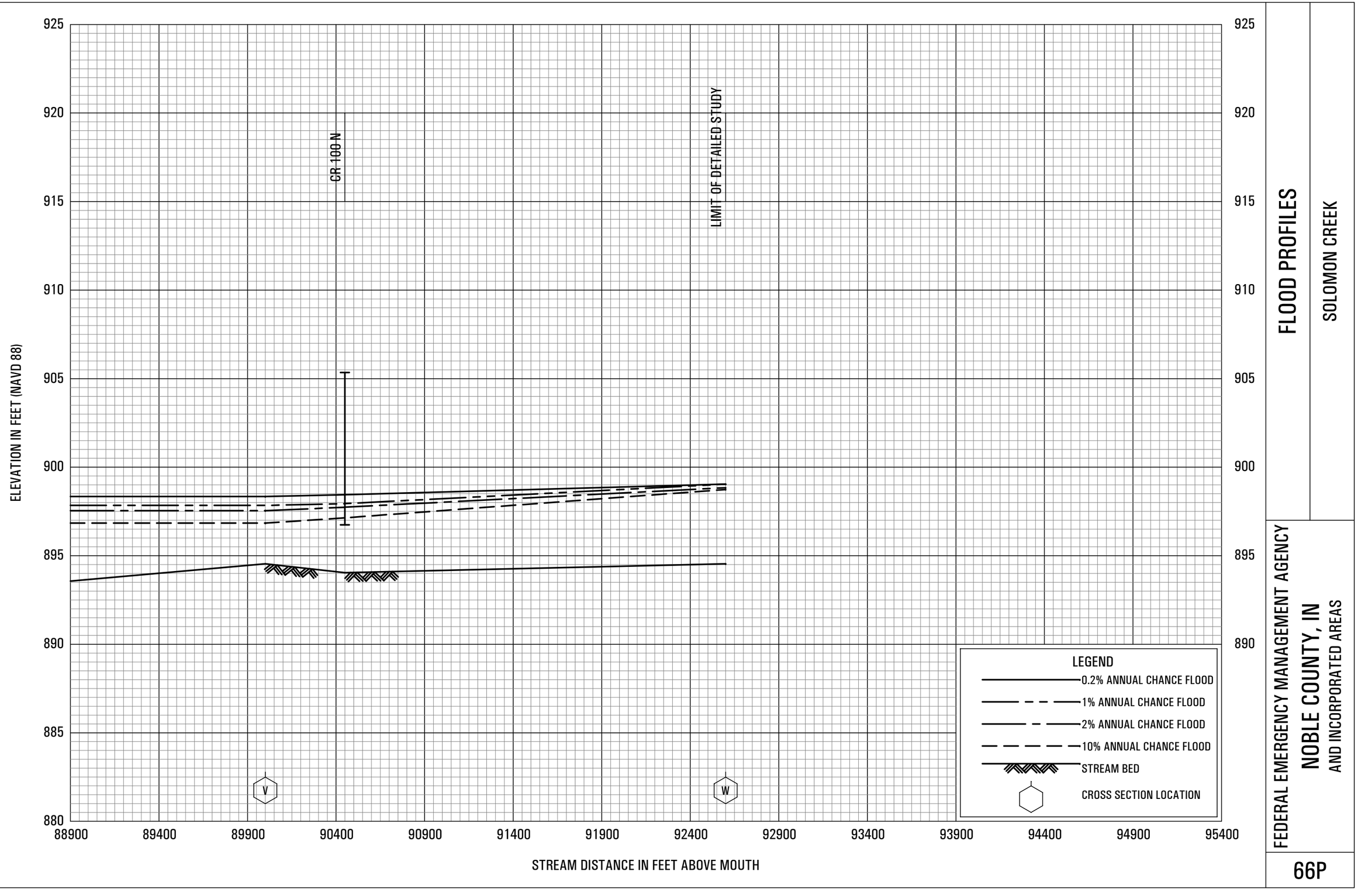
SOLOMON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

65P



FLOOD PROFILES

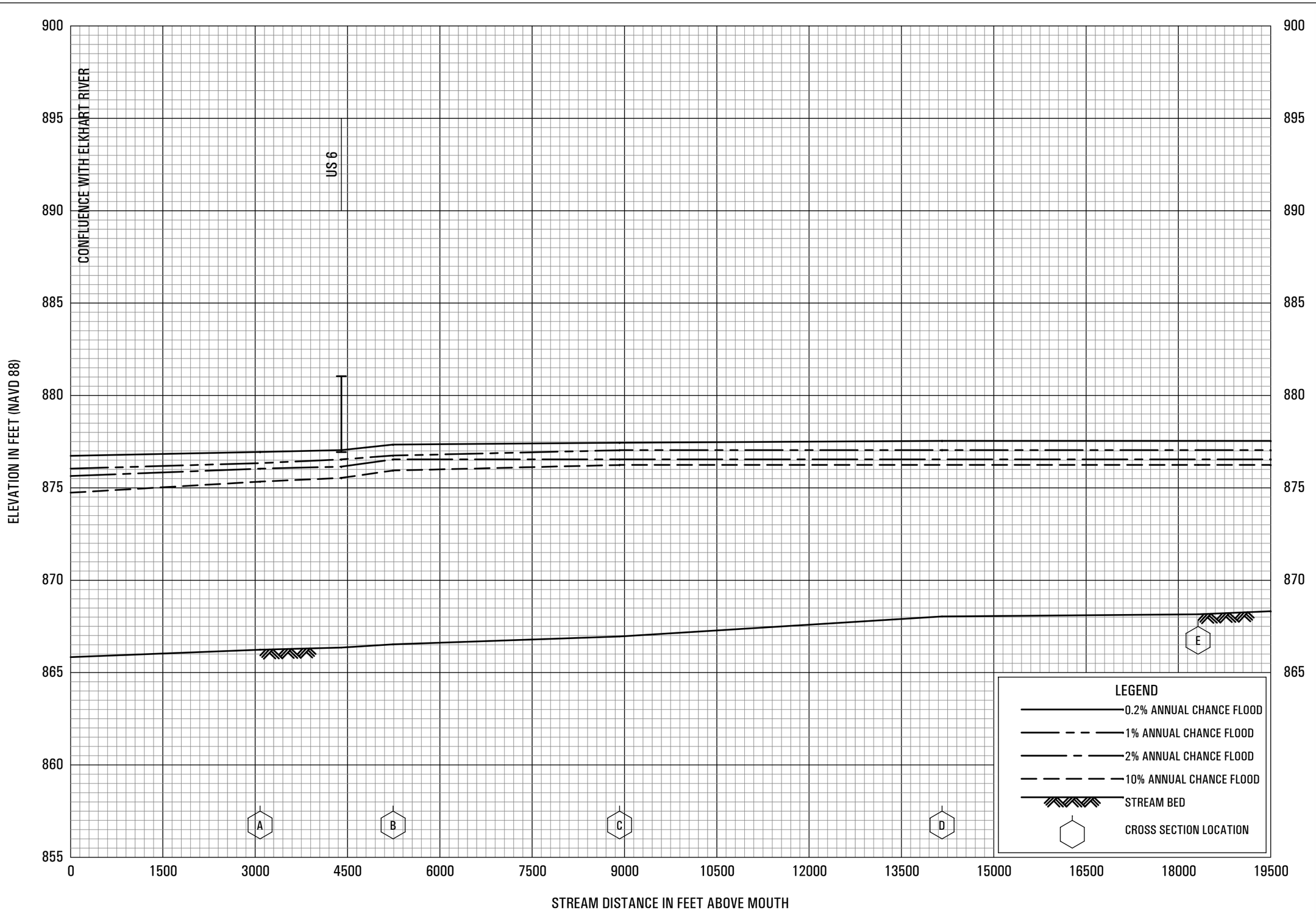
SOLOMON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

66P



FLOOD PROFILES

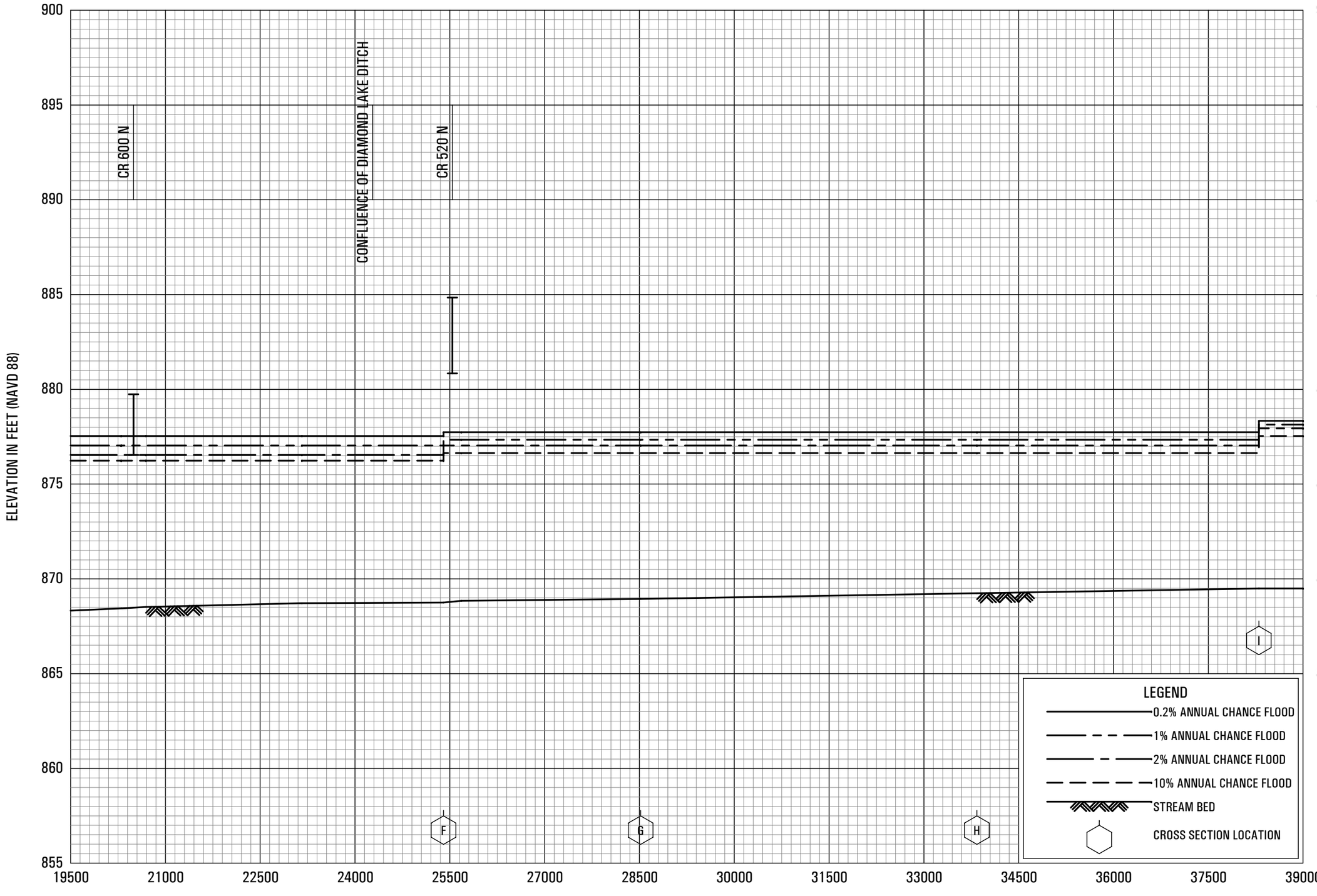
SOUTH BRANCH ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

67P



FLOOD PROFILES

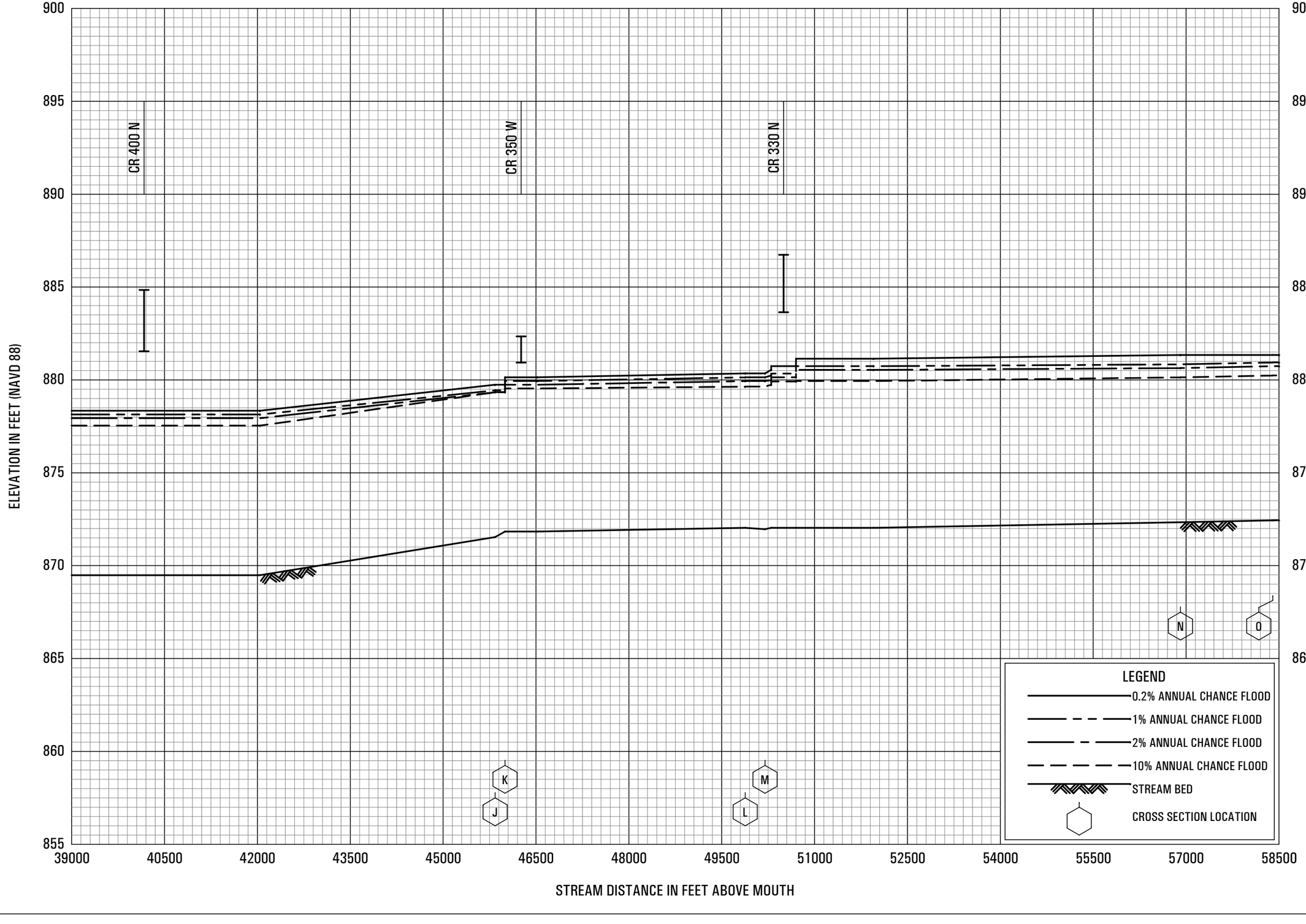
SOUTH BRANCH ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

68P



FLOOD PROFILES

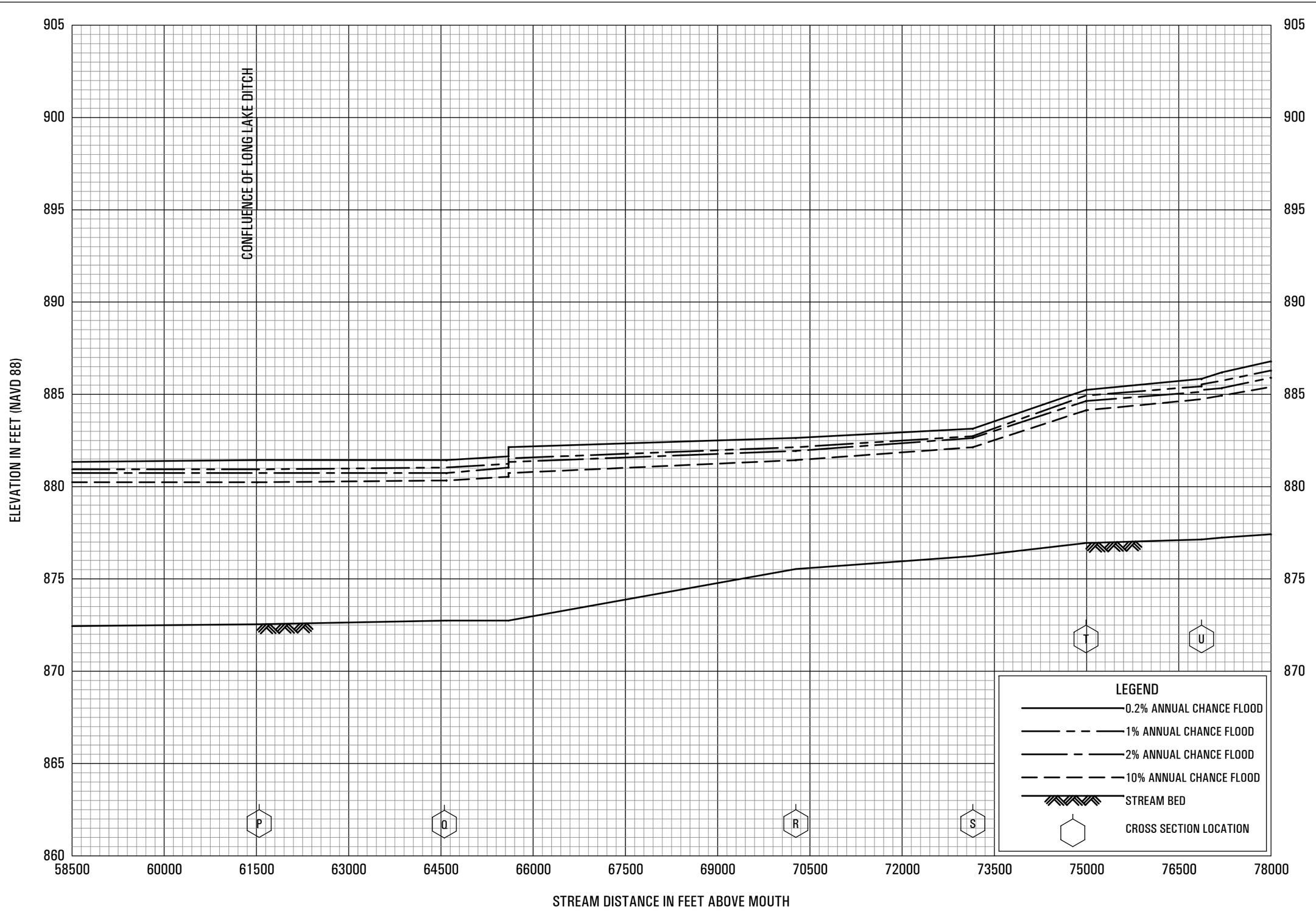
SOUTH BRANCH ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

69P



FLOOD PROFILES

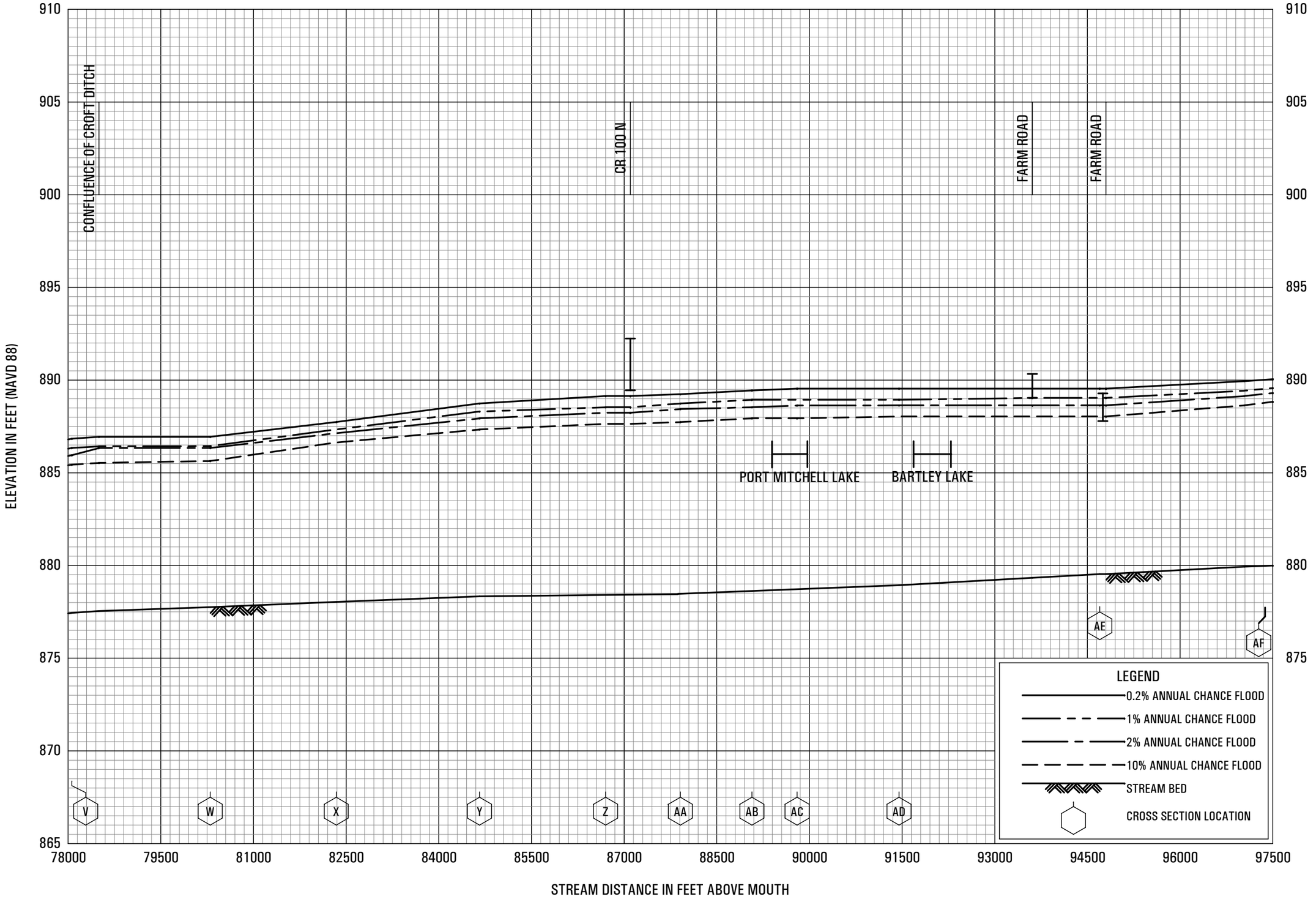
SOUTH BRANCH ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

70P



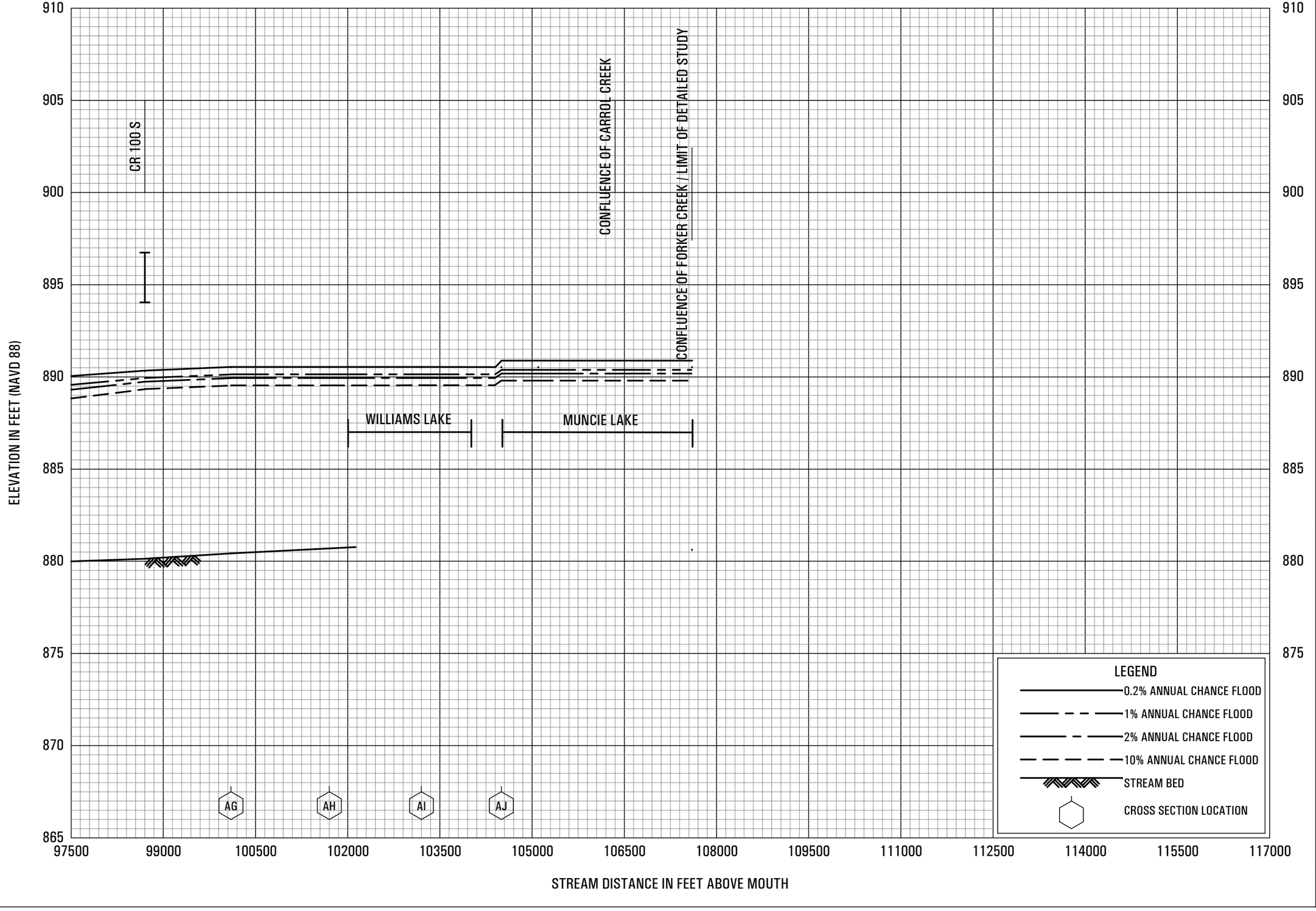
FLOOD PROFILES

SOUTH BRANCH ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

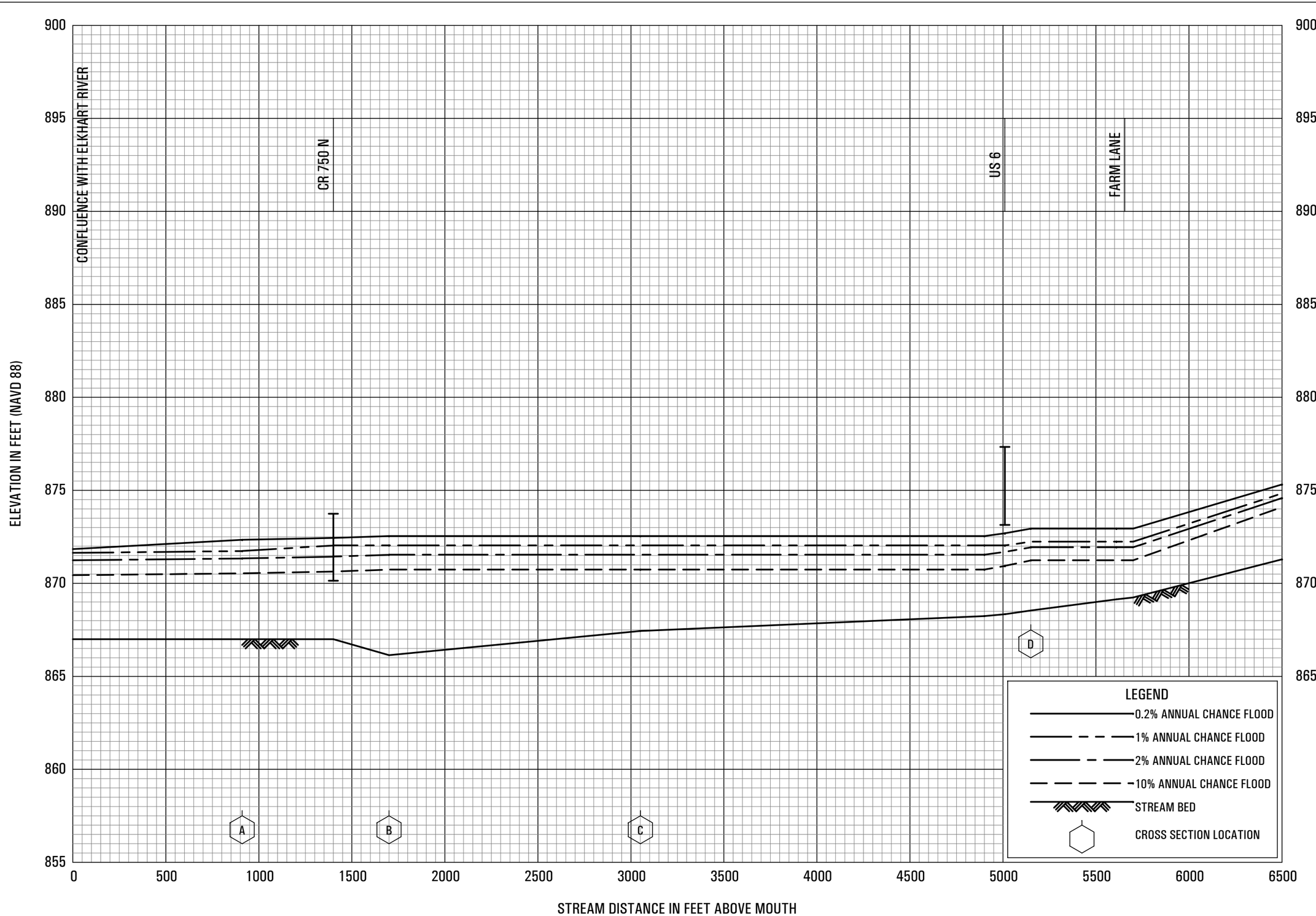
SOUTH BRANCH ELKHART RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

72P



FLOOD PROFILES

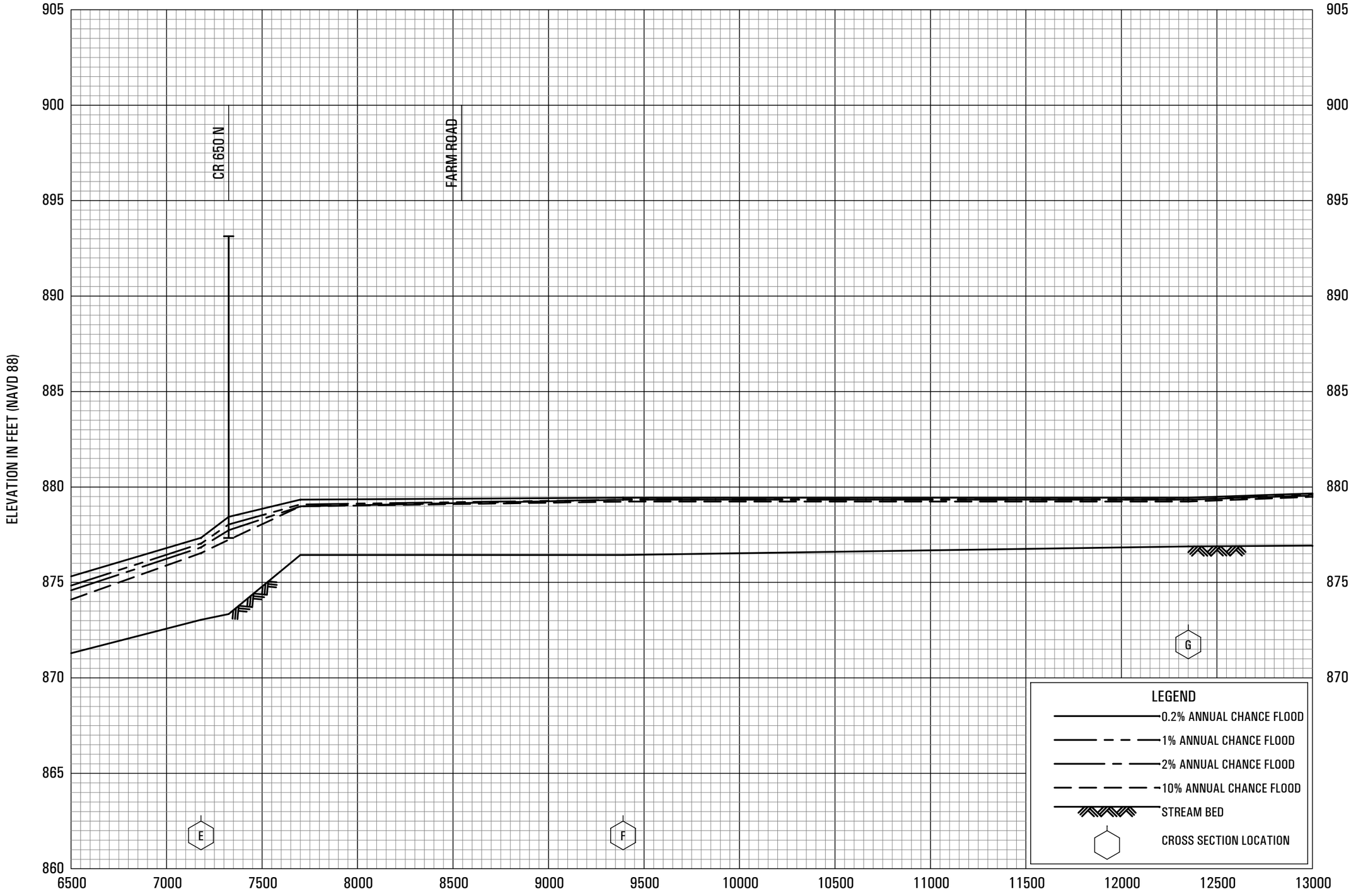
SPARTA LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

73P



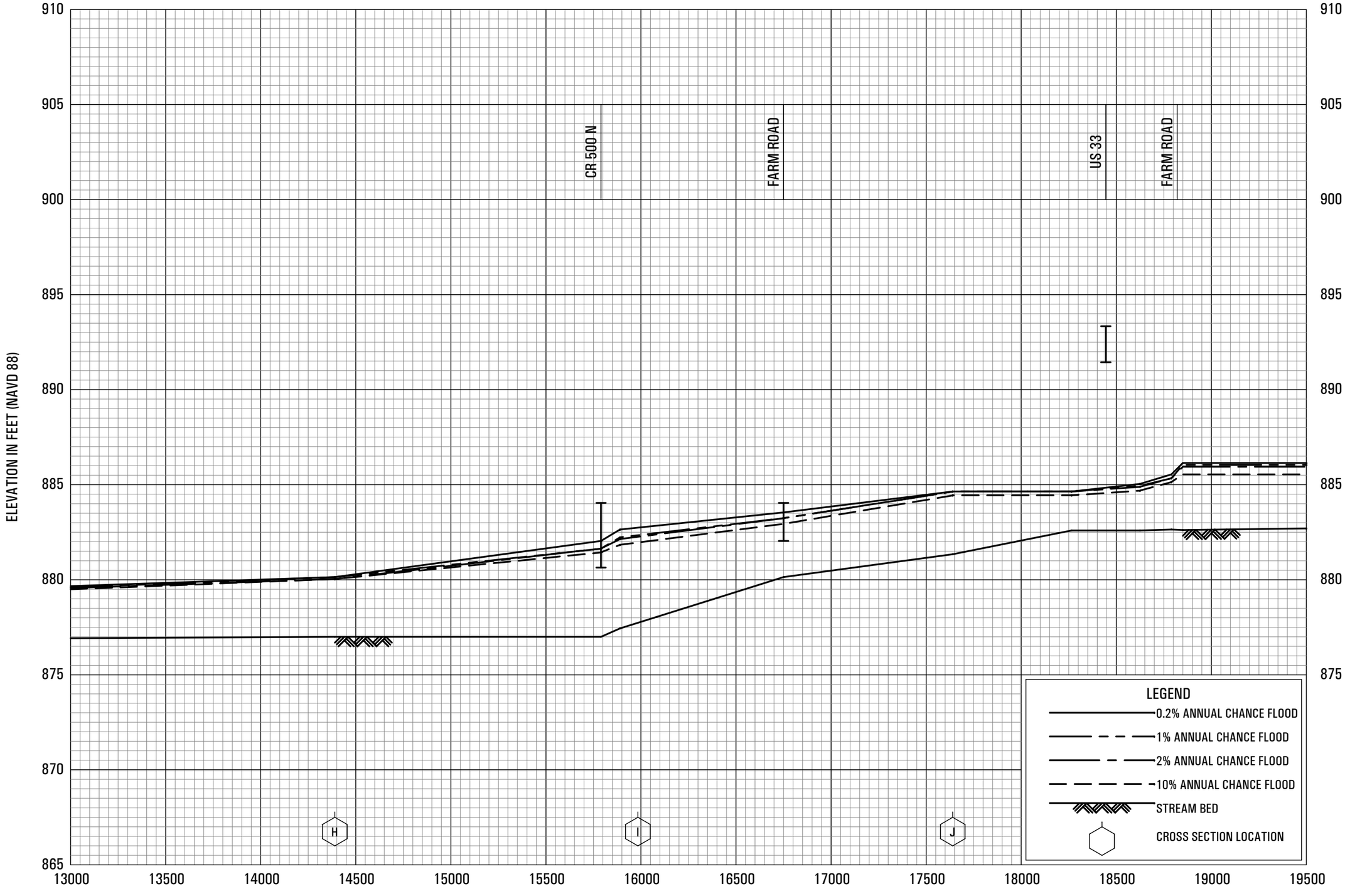
FLOOD PROFILES

SPARTA LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

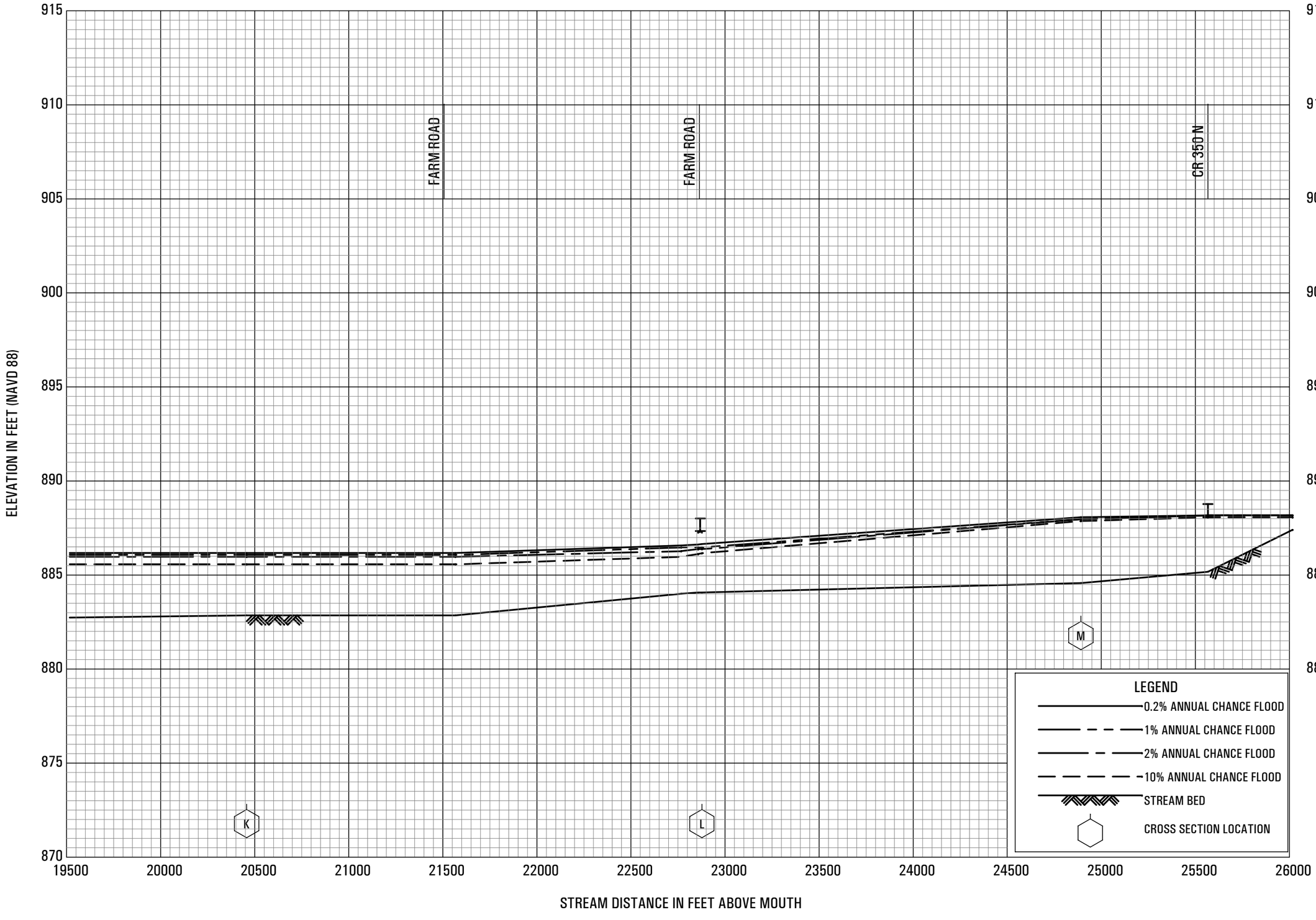
SPARTA LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

75P



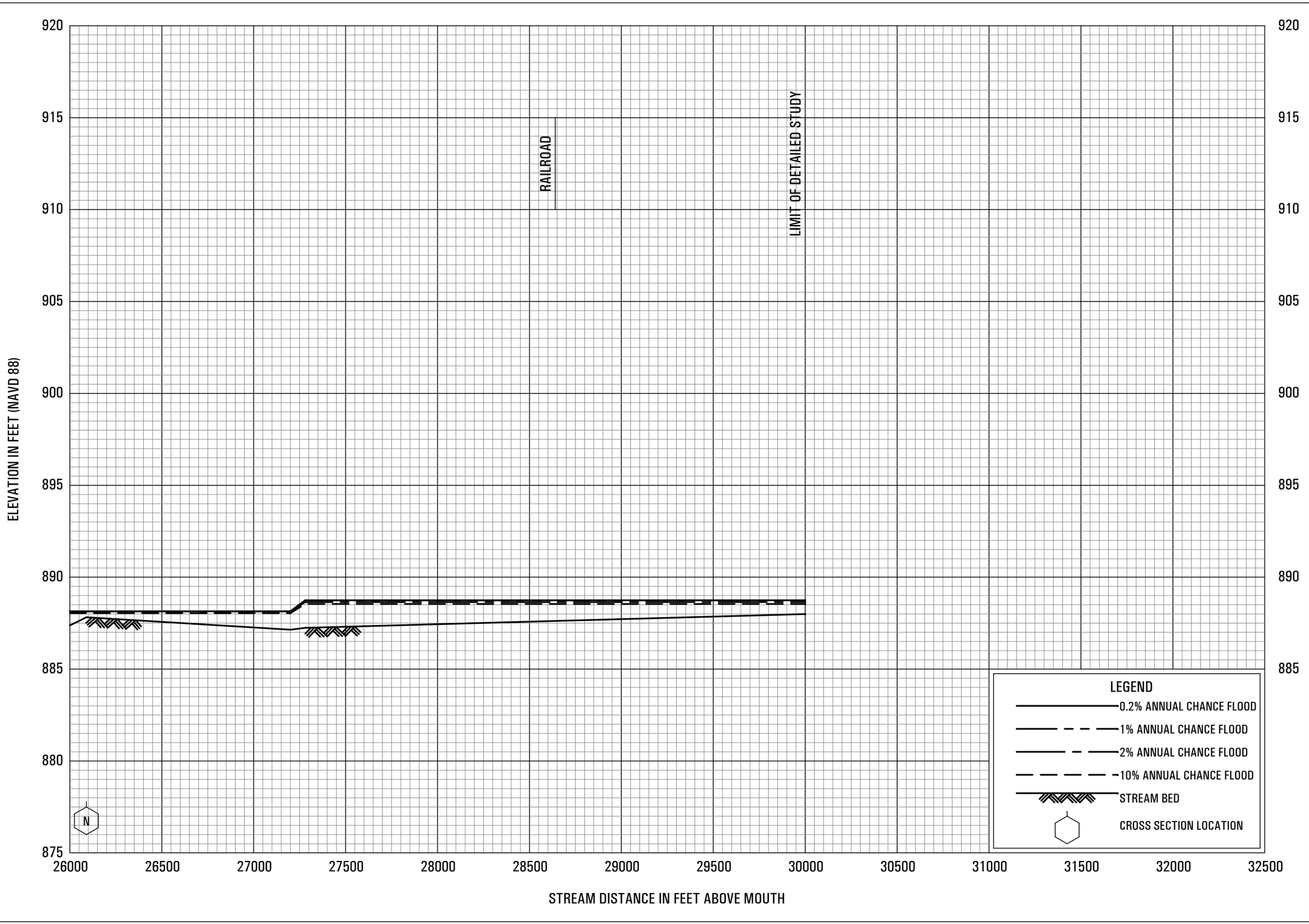
FLOOD PROFILES

SPARTA LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN
AND INCORPORATED AREAS

76P



FLOOD PROFILES

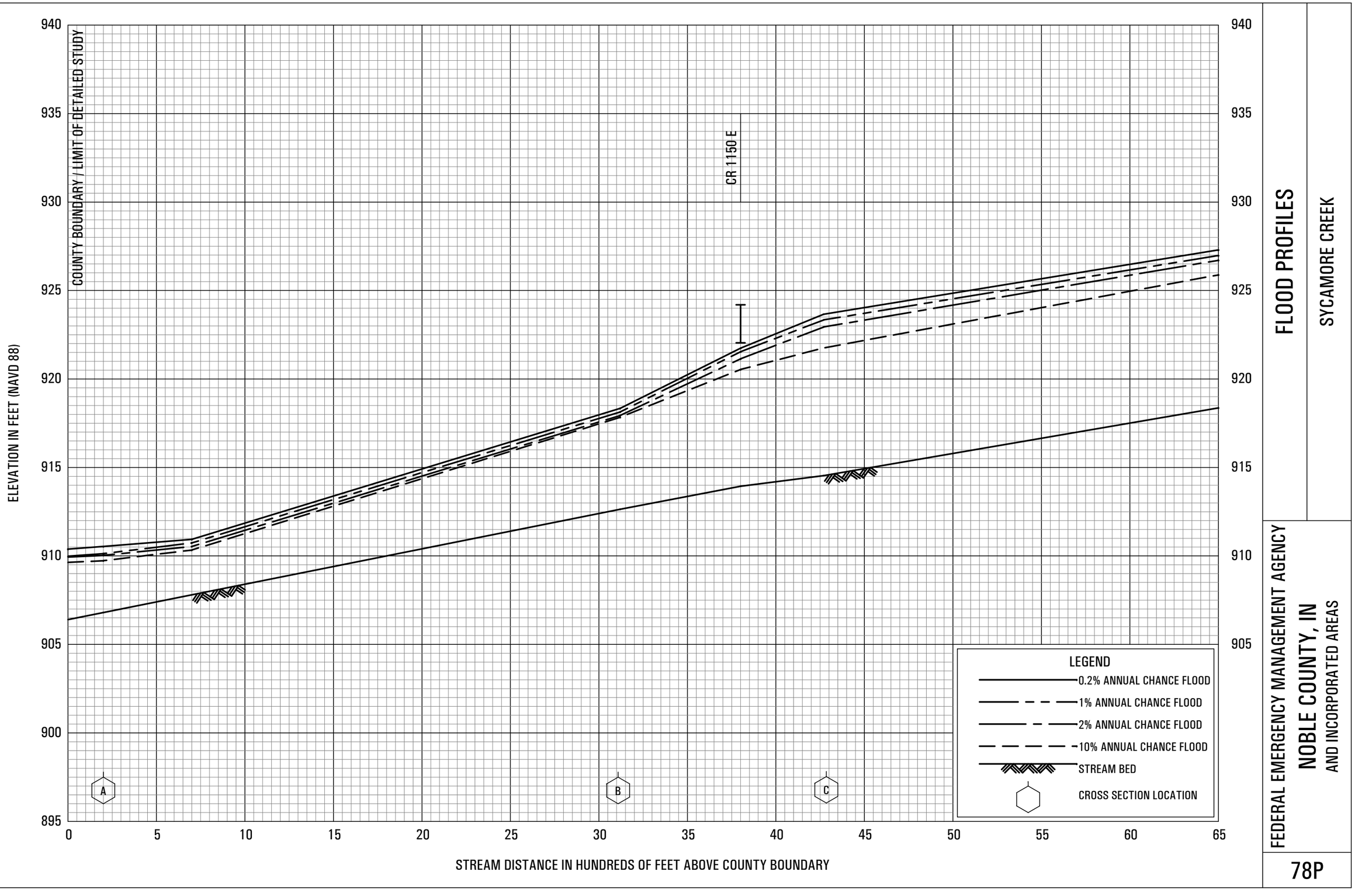
SPARTA LAKE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

77P



FLOOD PROFILES

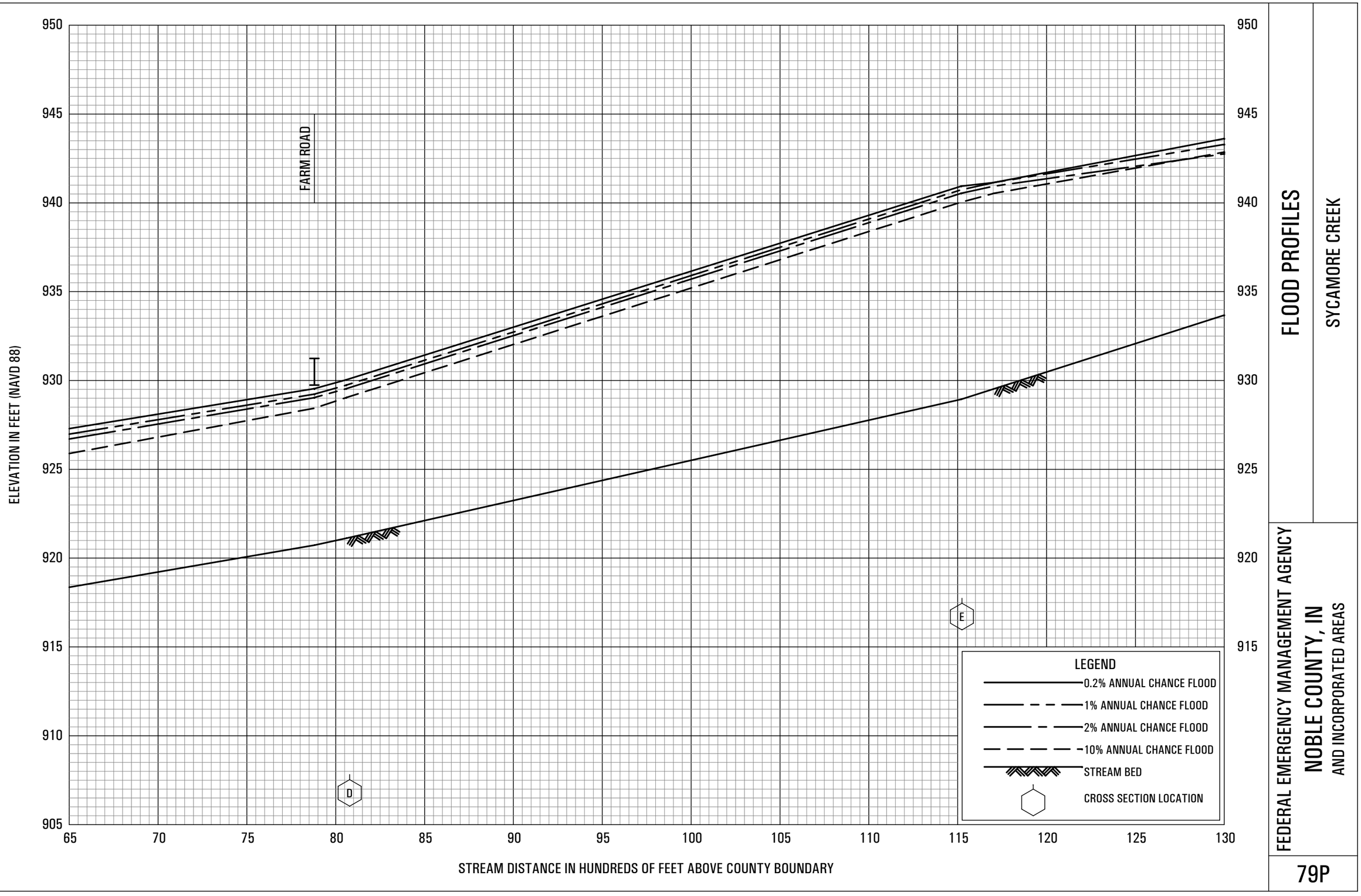
SYCAMORE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

78P



FLOOD PROFILES

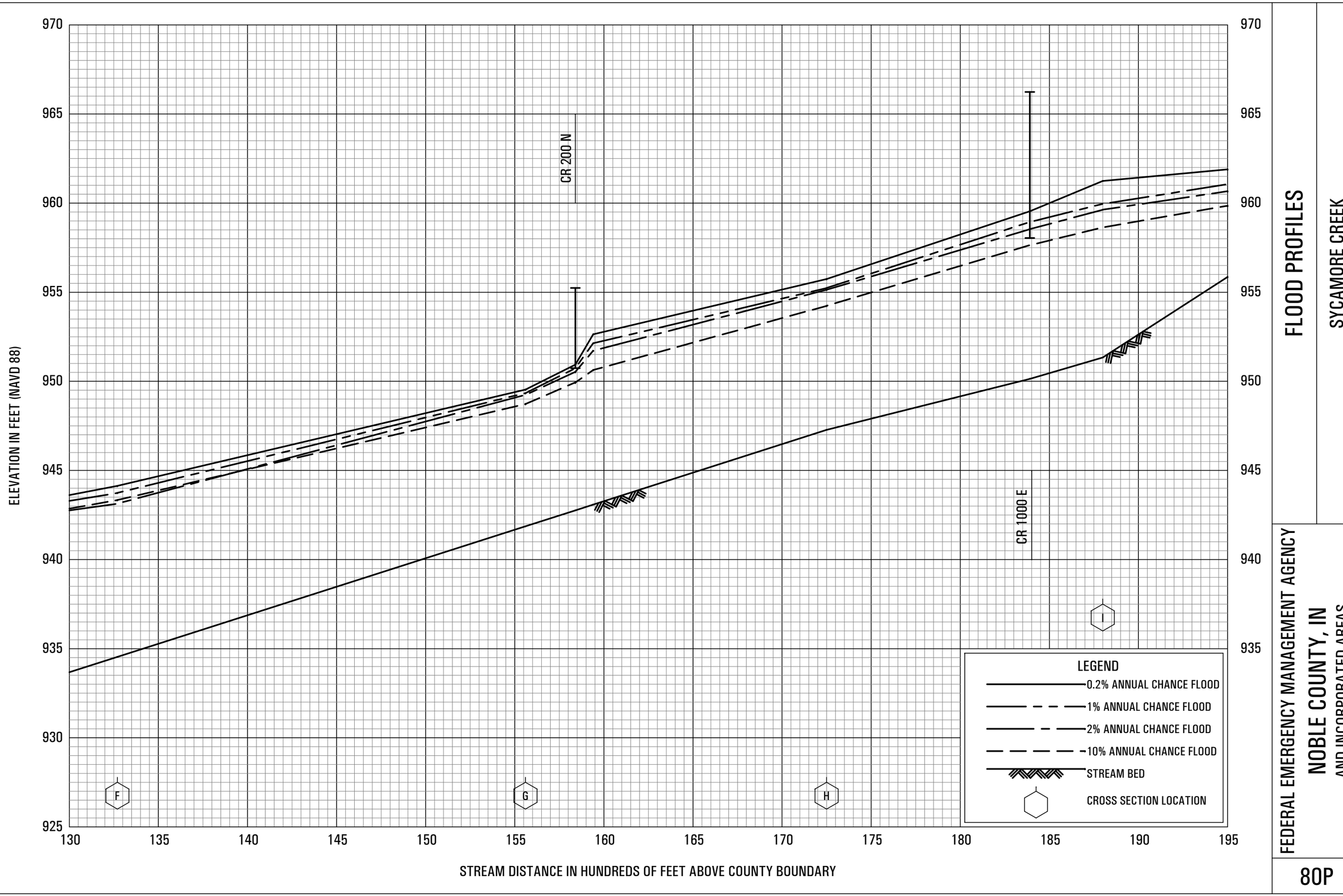
SYCAMORE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

79P



FLOOD PROFILES

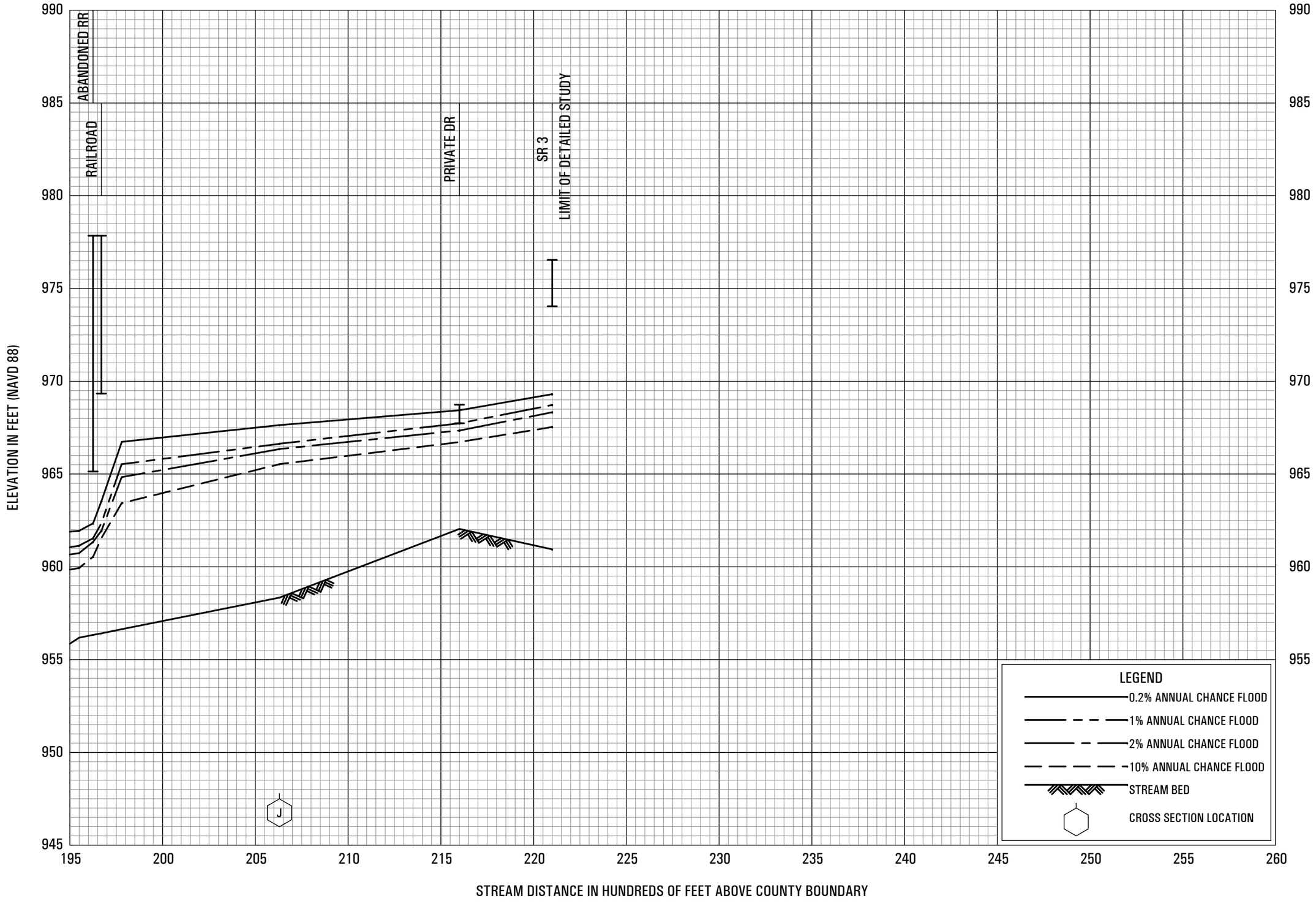
SYCAMORE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

80P



FLOOD PROFILES

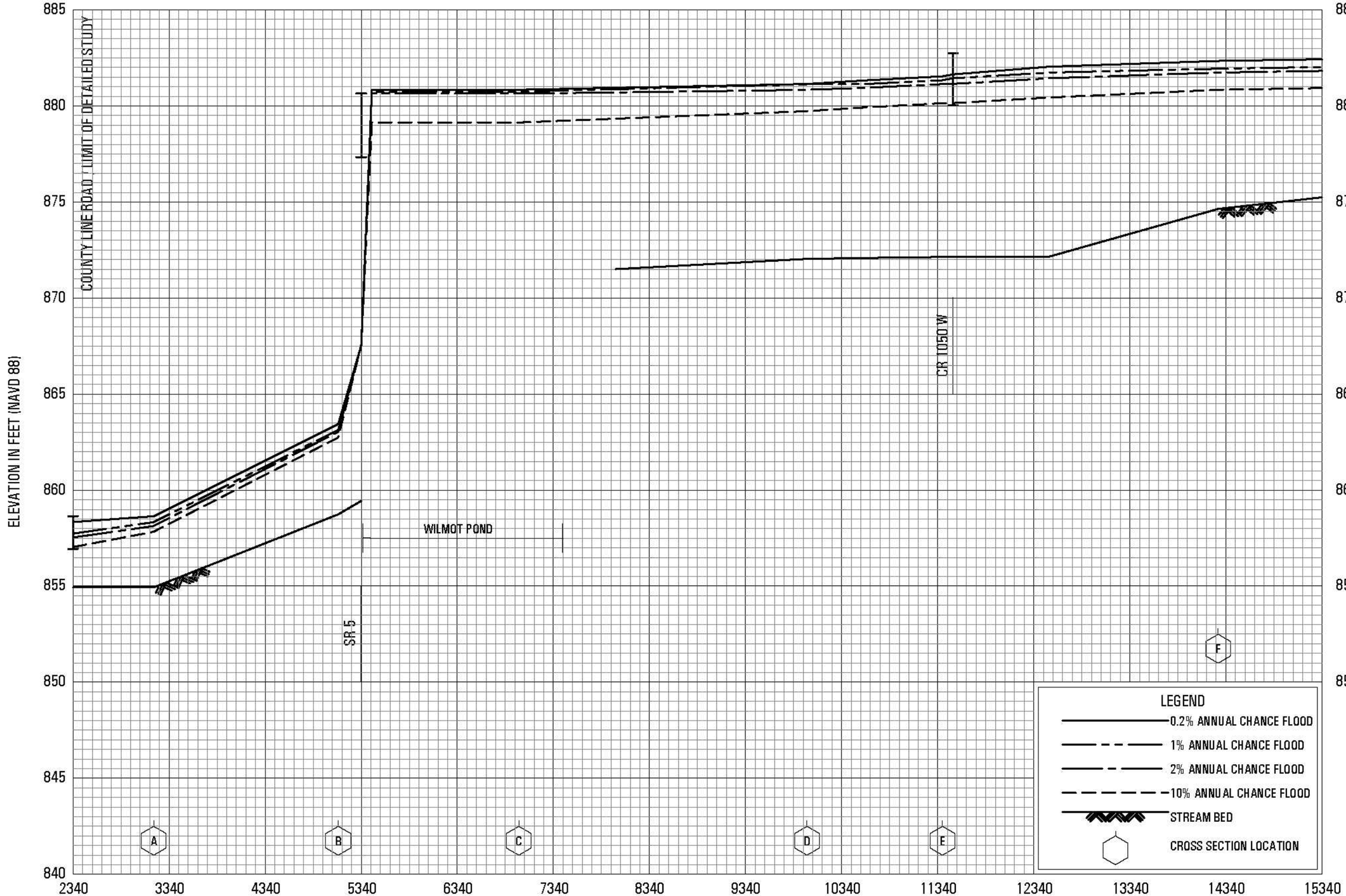
SYCAMORE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

81P



FLOOD PROFILES

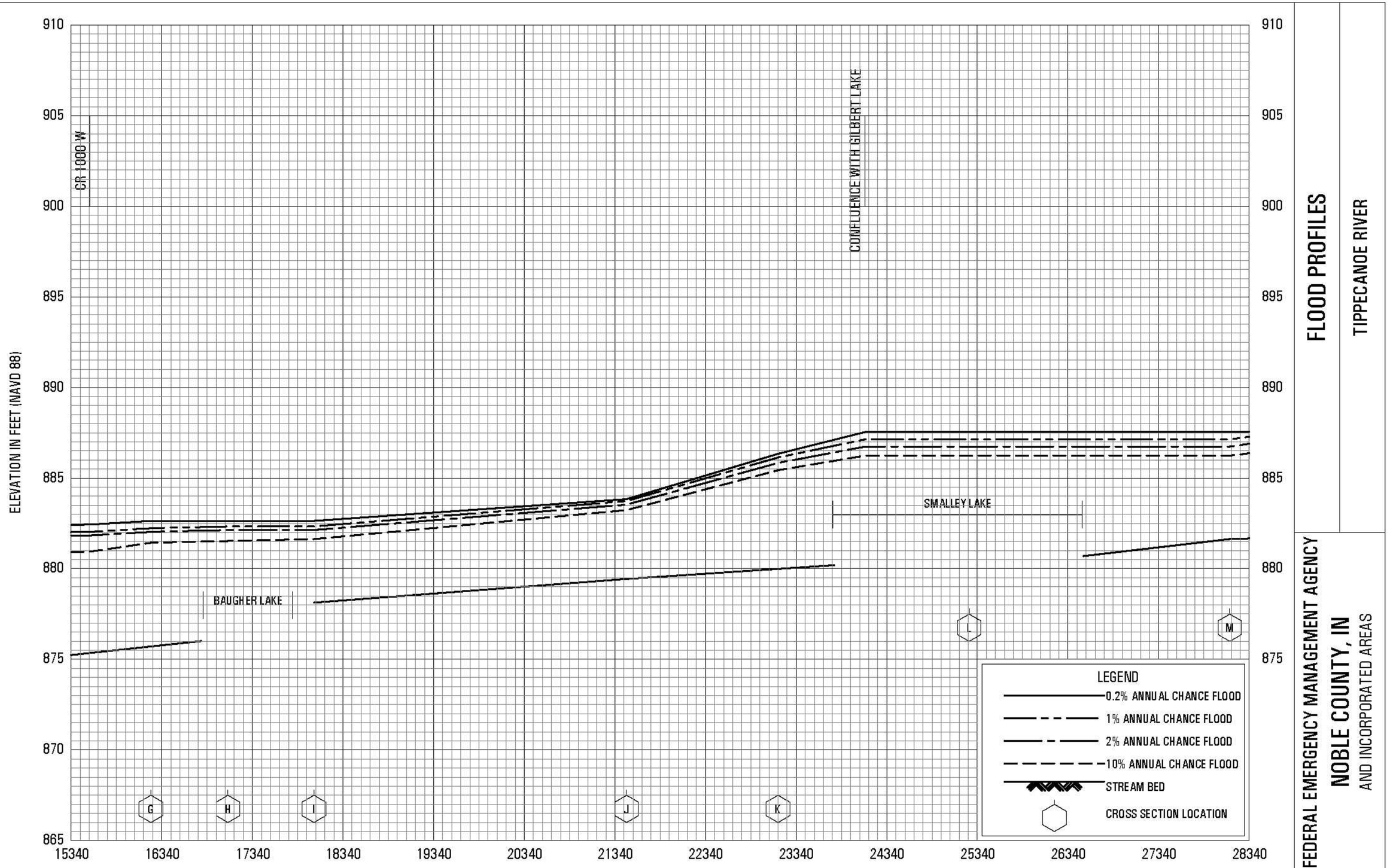
TIPPECANOE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

82P



FLOOD PROFILES

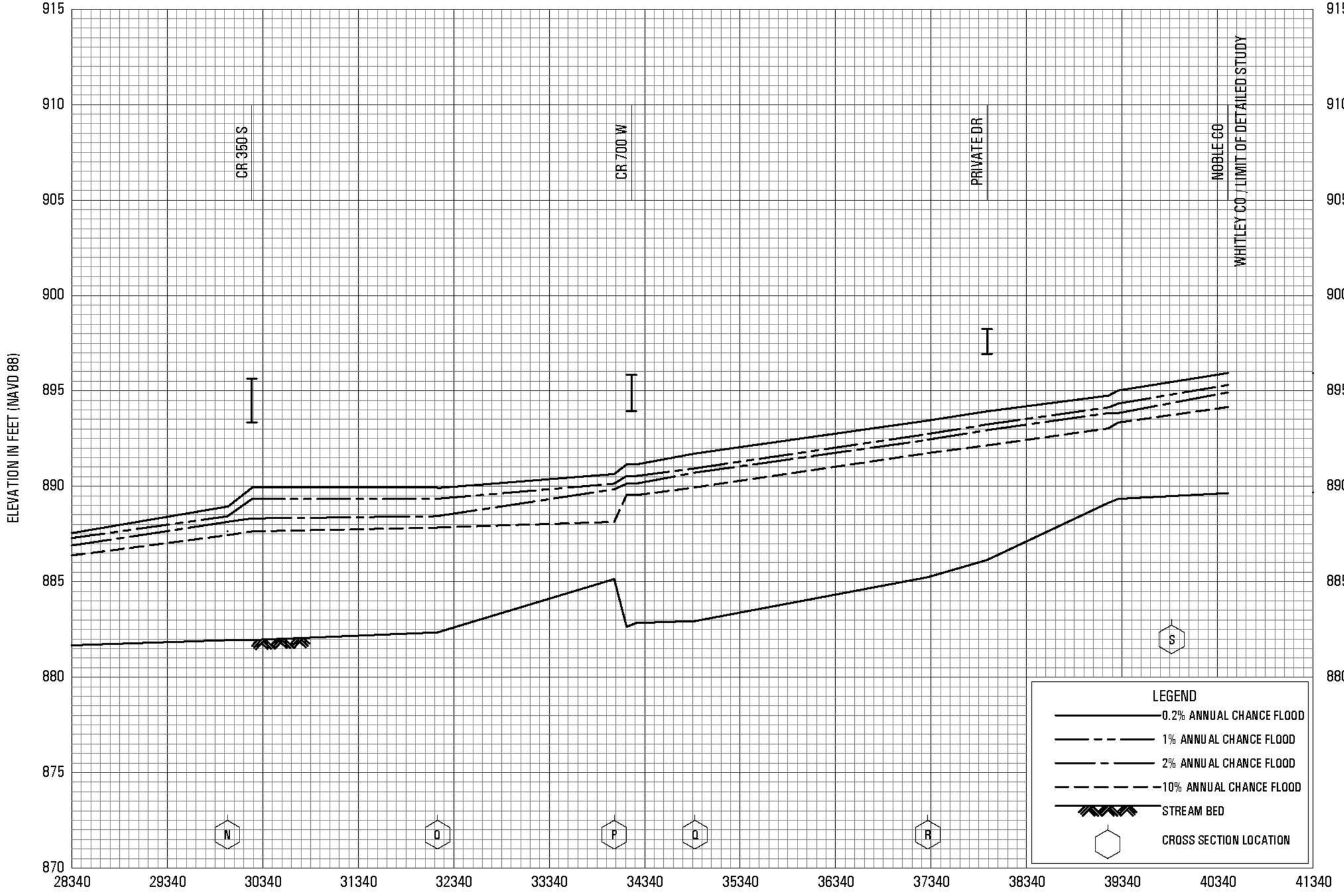
TIPPECANOE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

83P



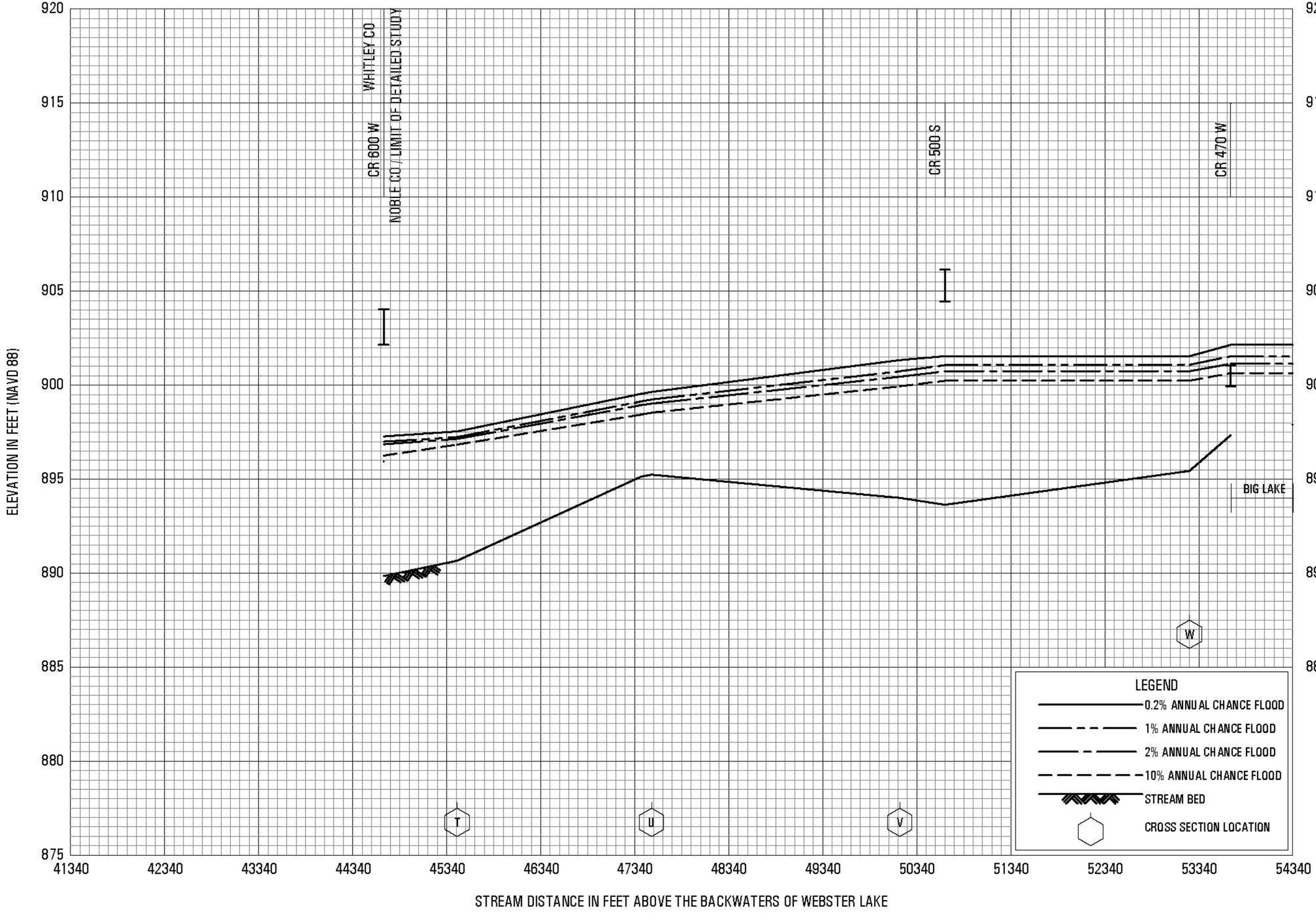
FLOOD PROFILES

TIPPECANOE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



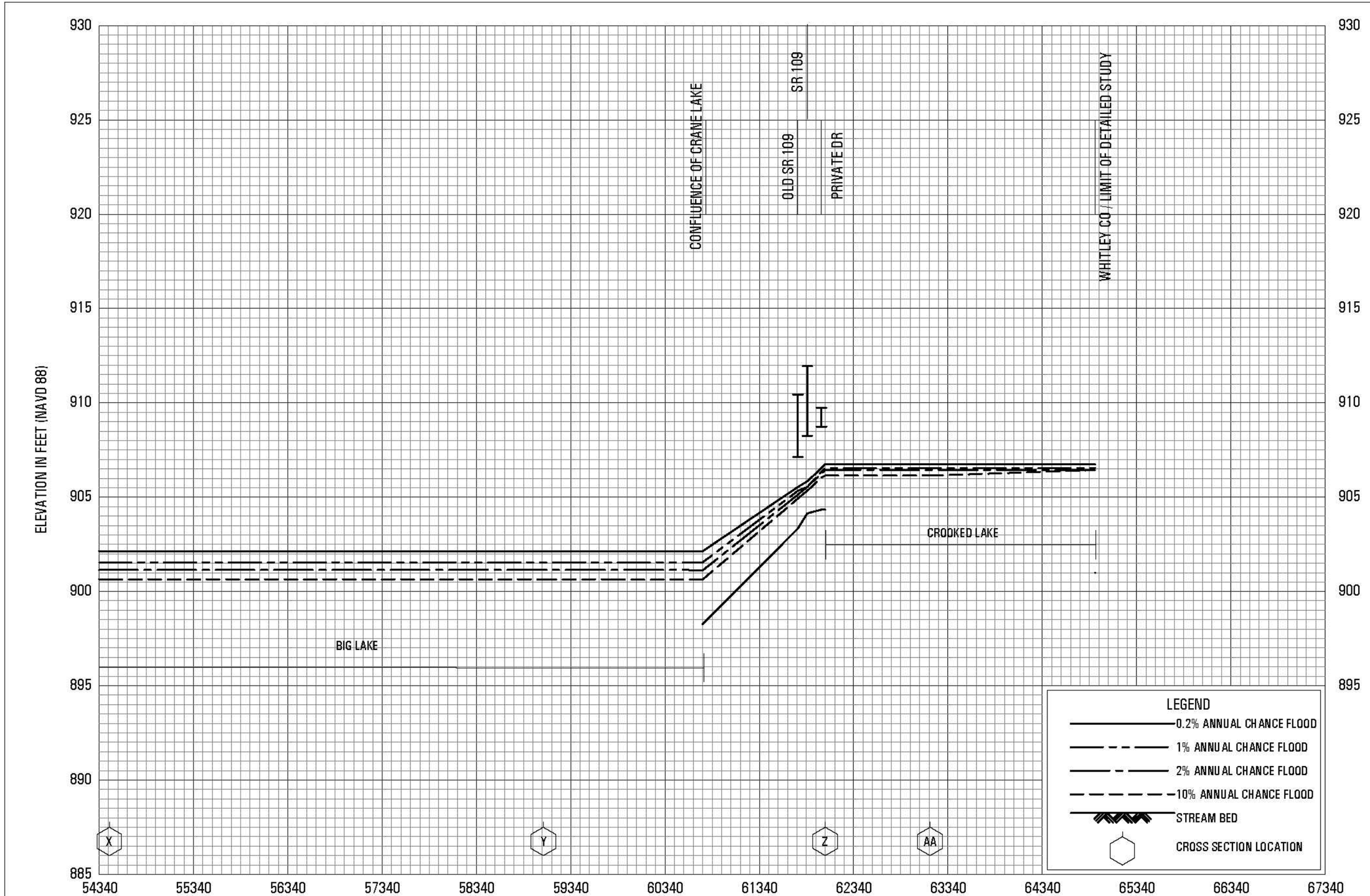
FLOOD PROFILES

TIPPECANOE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



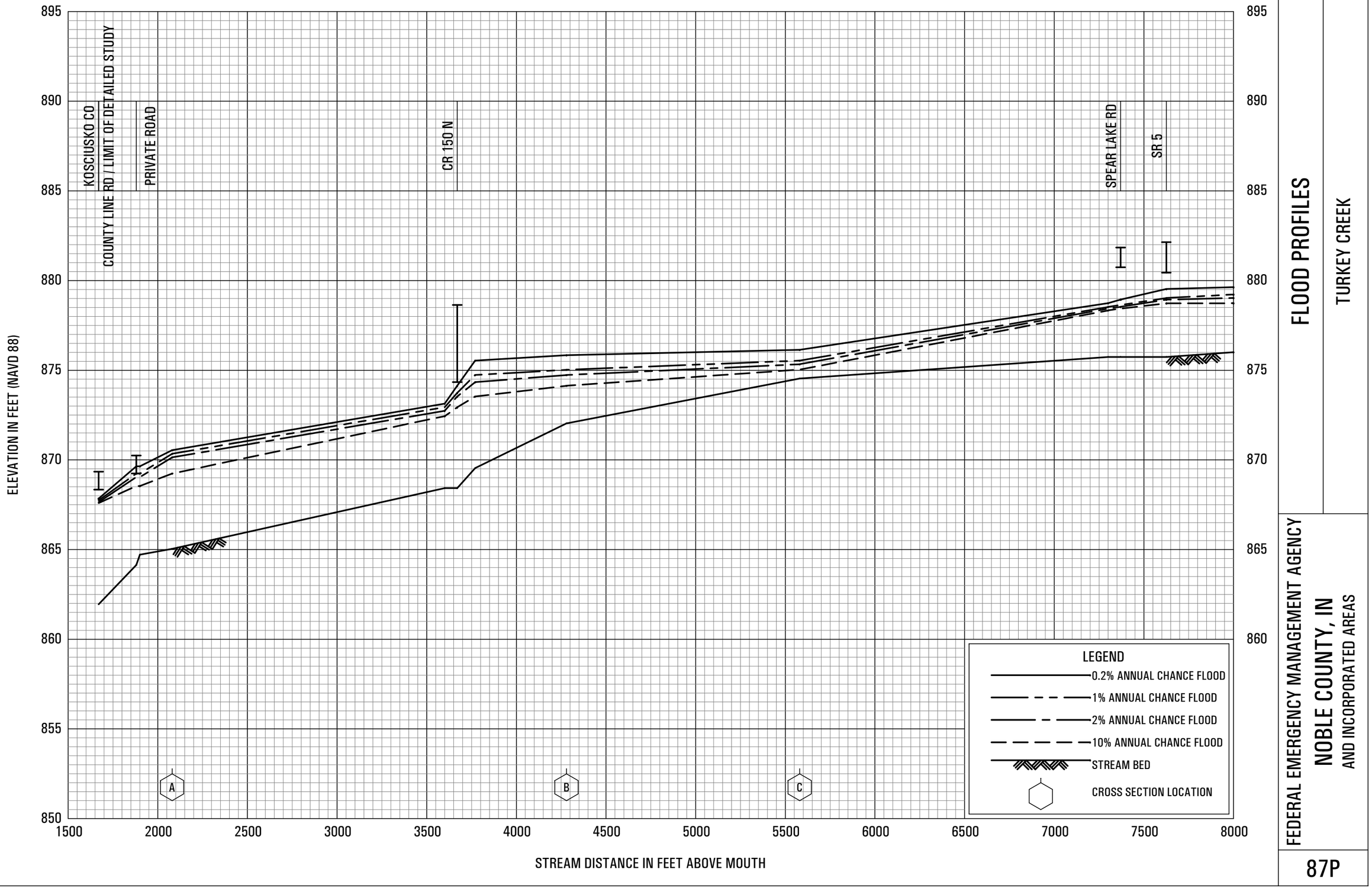
FLOOD PROFILES

TIPPECANOE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS



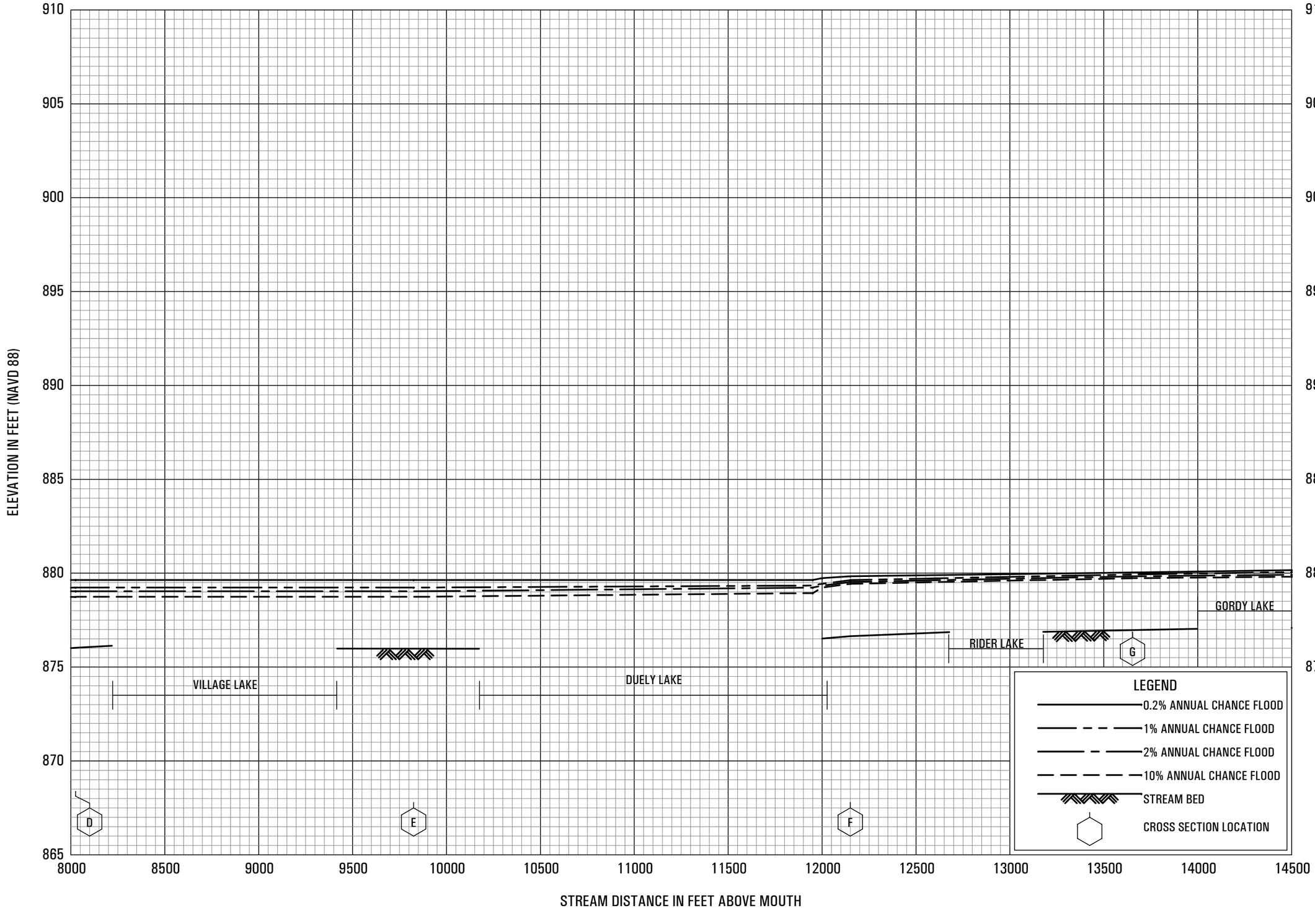
FLOOD PROFILES

TURKEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN
AND INCORPORATED AREAS

87P



FLOOD PROFILES

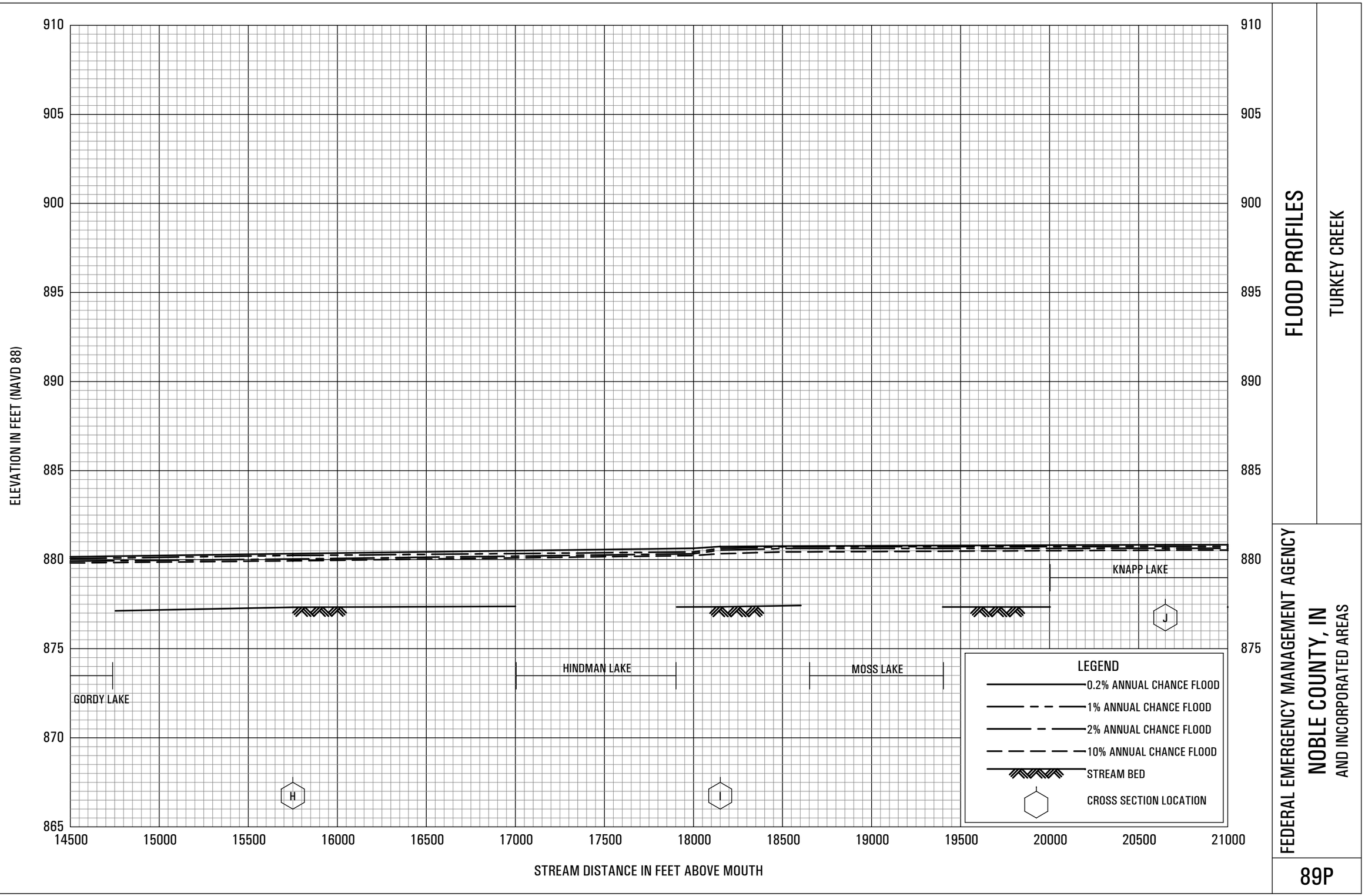
TURKEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

88P



FLOOD PROFILES

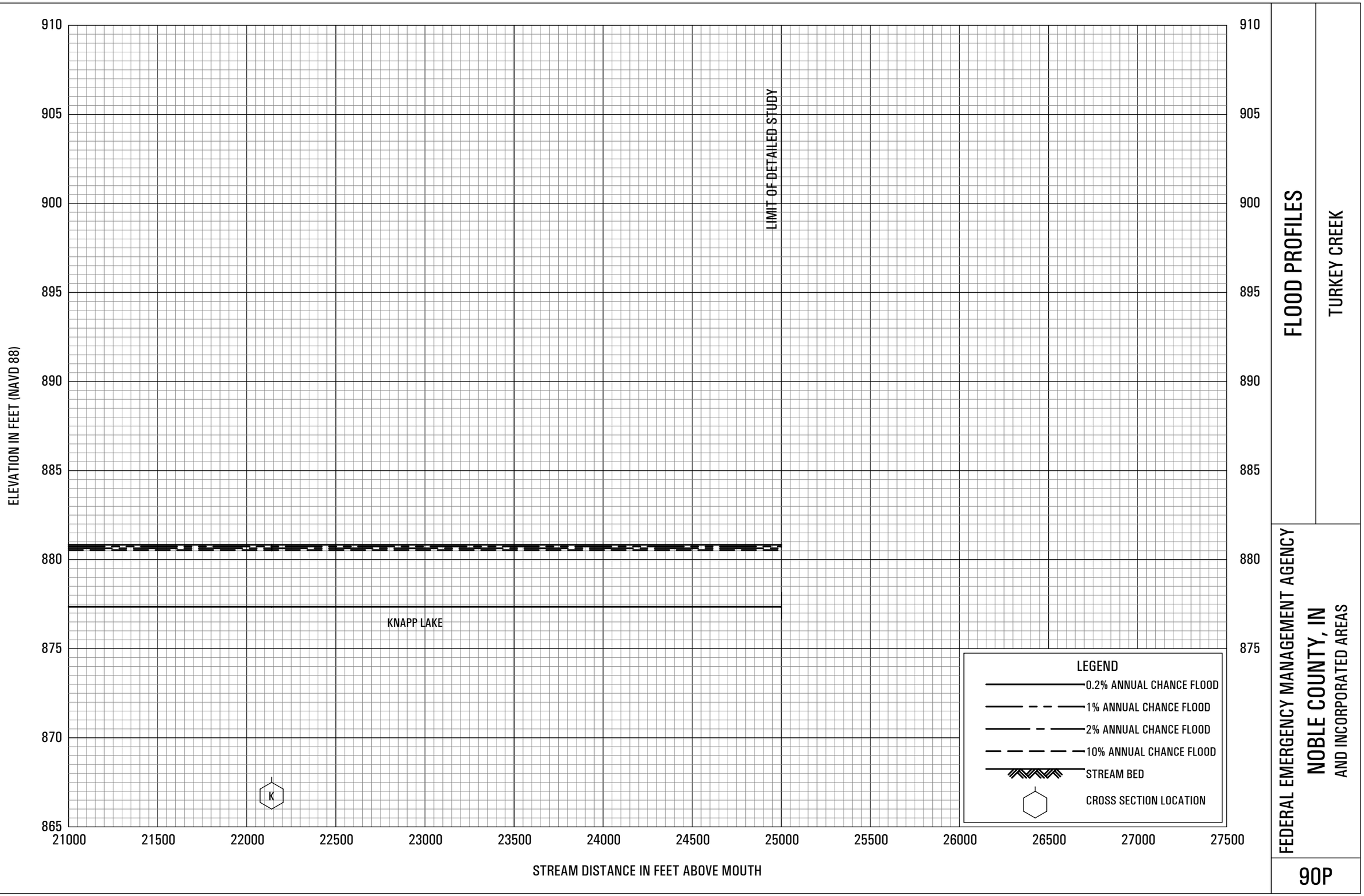
TURKEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

89P



FLOOD PROFILES

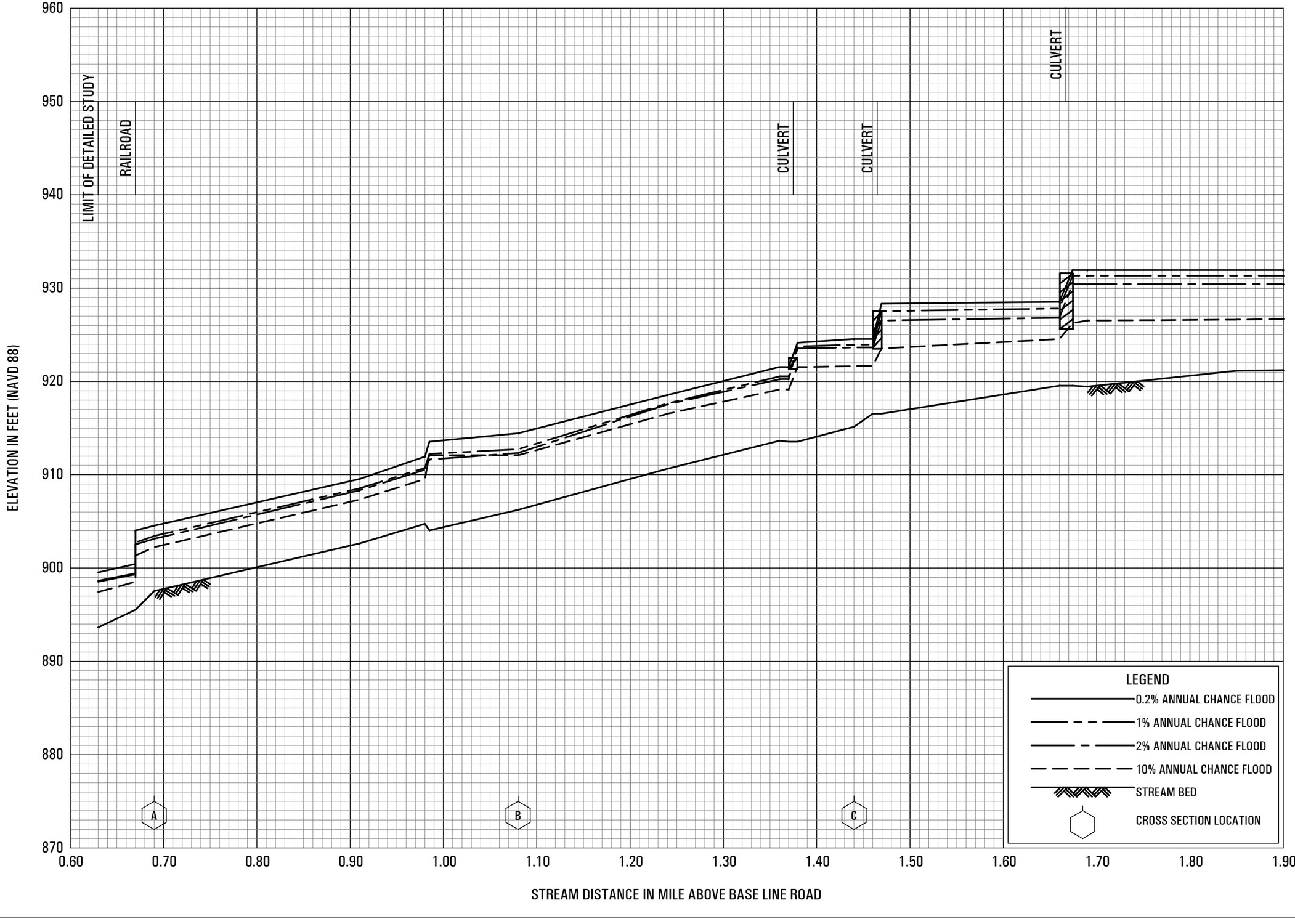
TURKEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

90P



FLOOD PROFILES

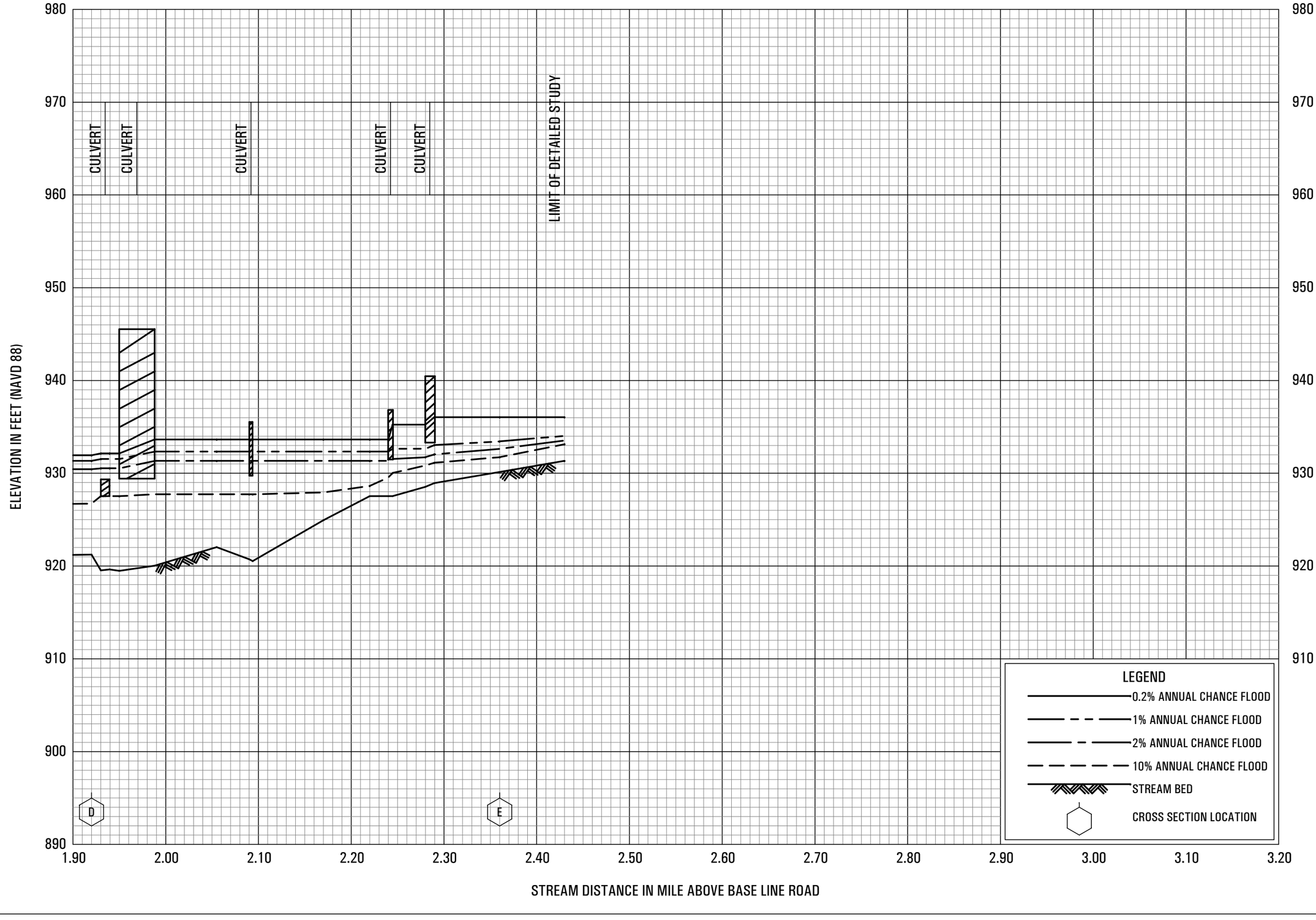
VAN GORDER DRAIN

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

91P



FLOOD PROFILES

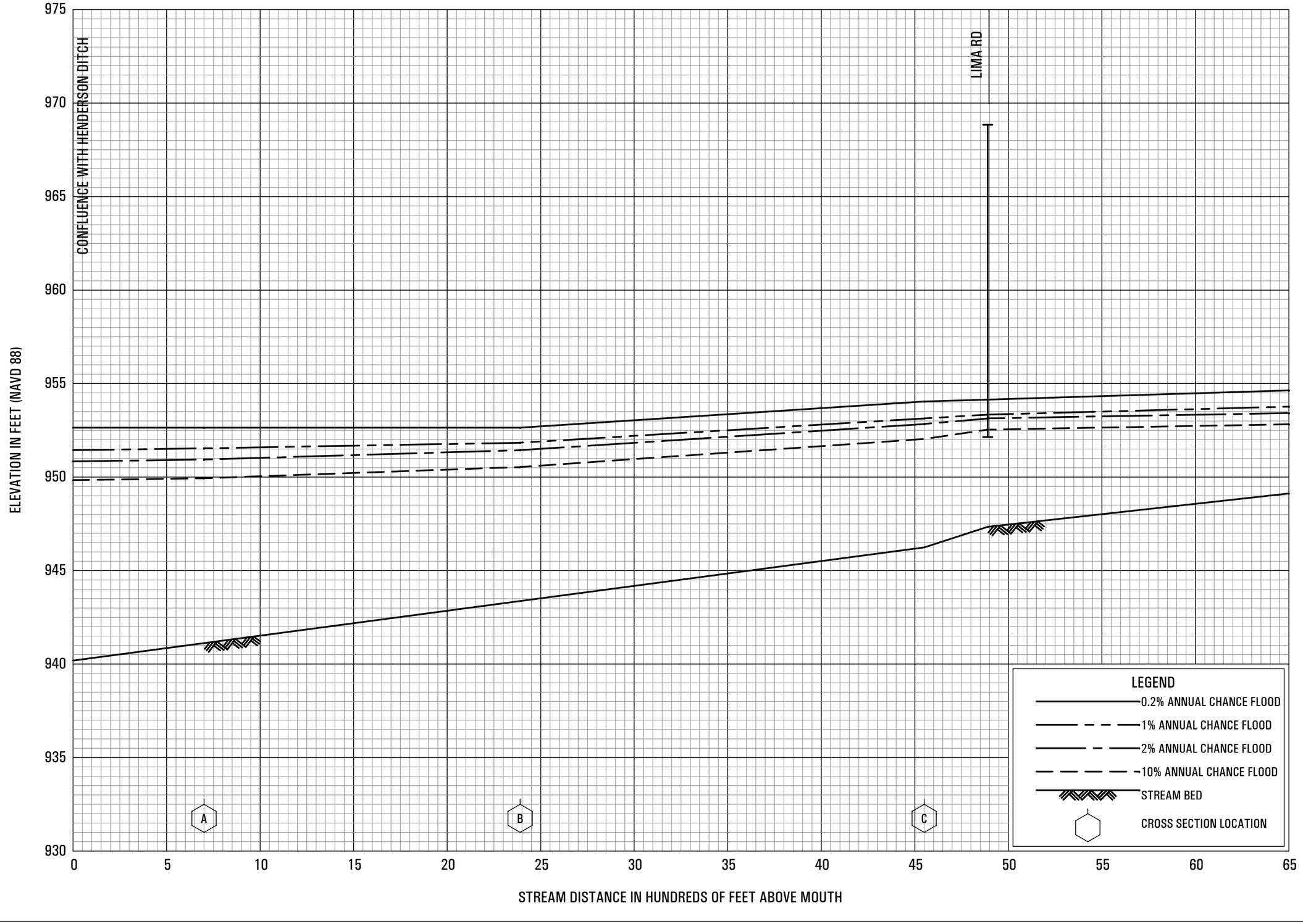
VAN GORDER DRAIN

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

92P



FLOOD PROFILES

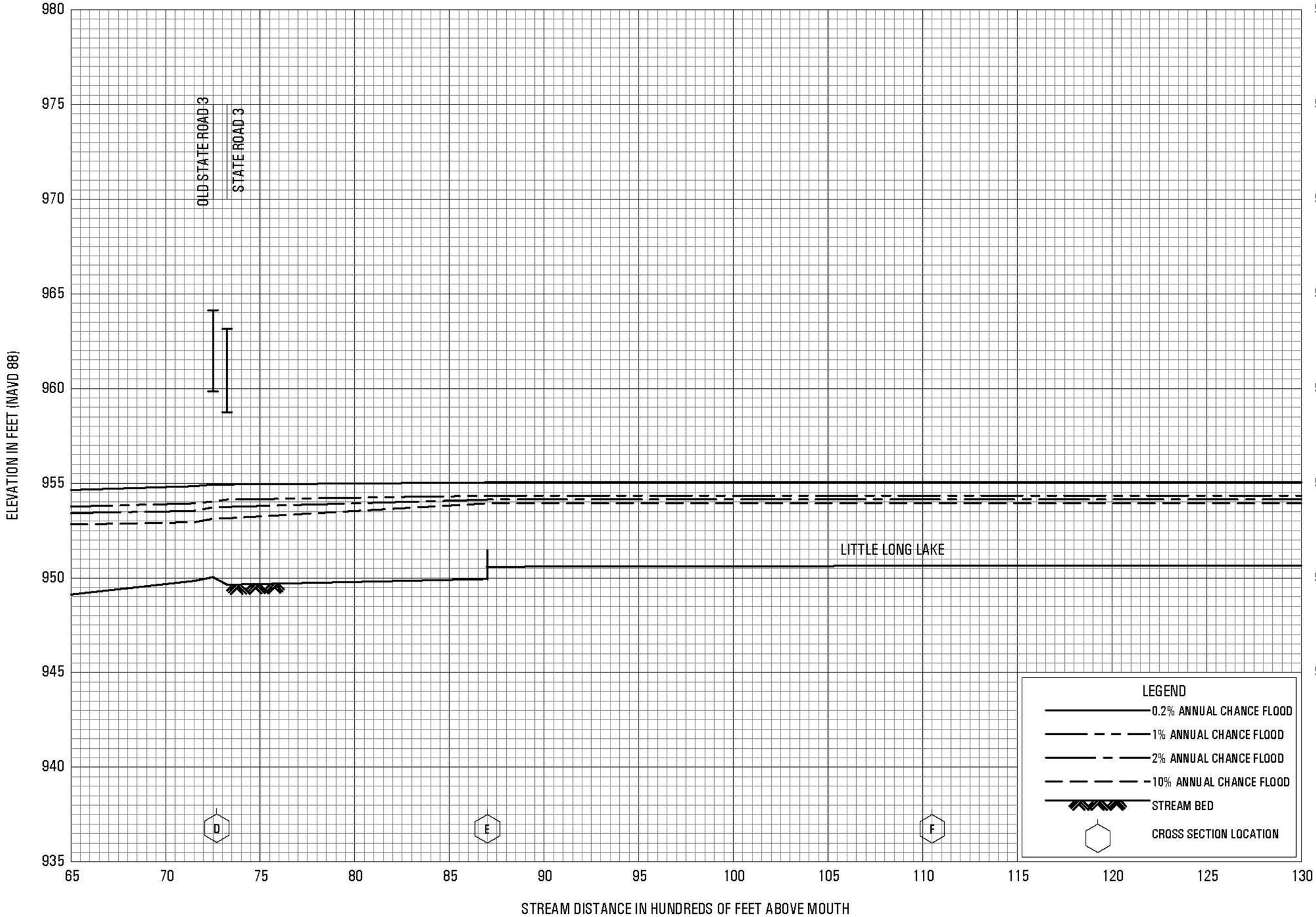
WATERHOUSE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

93P



FLOOD PROFILES

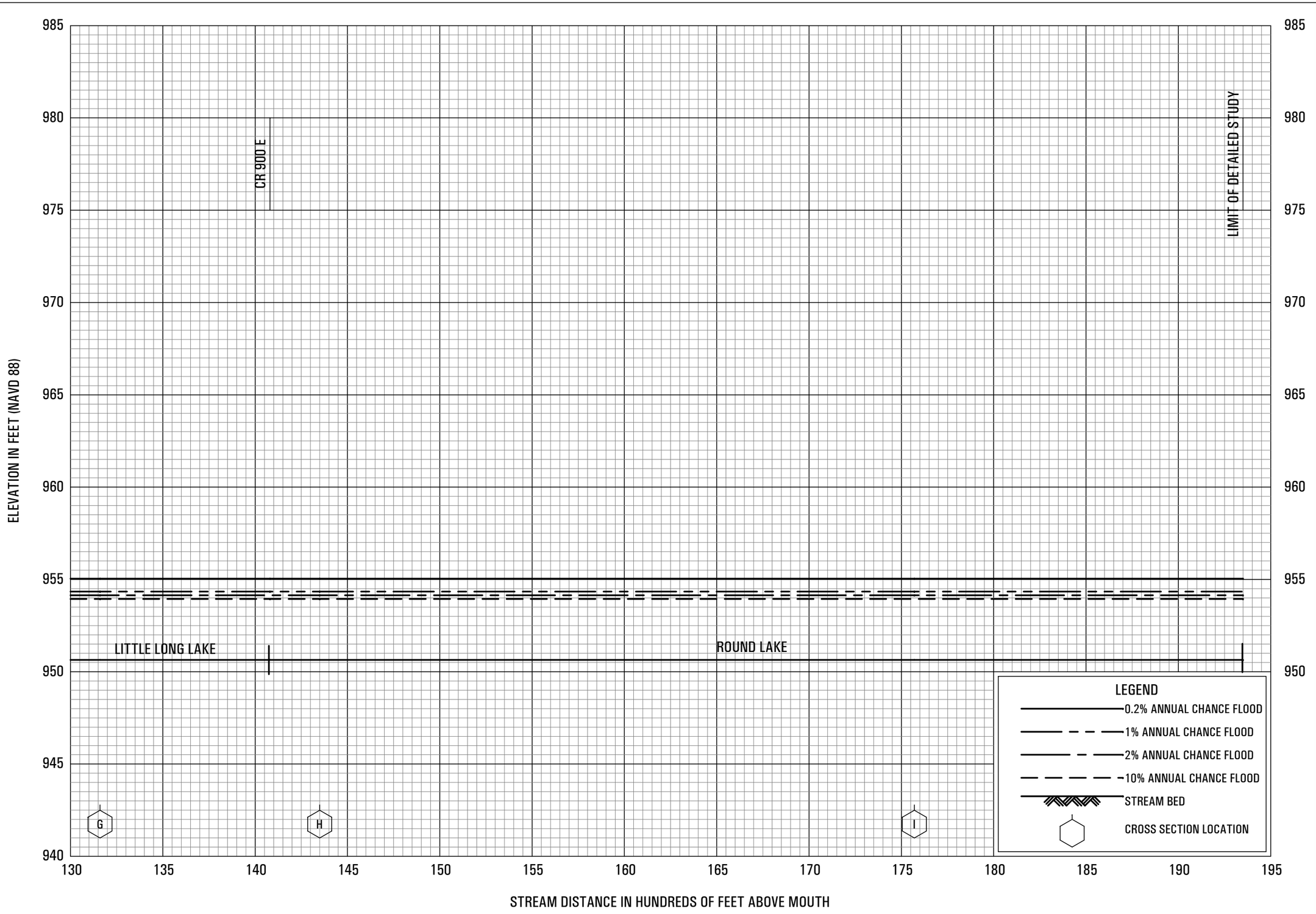
WATERHOUSE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

94P



FLOOD PROFILES

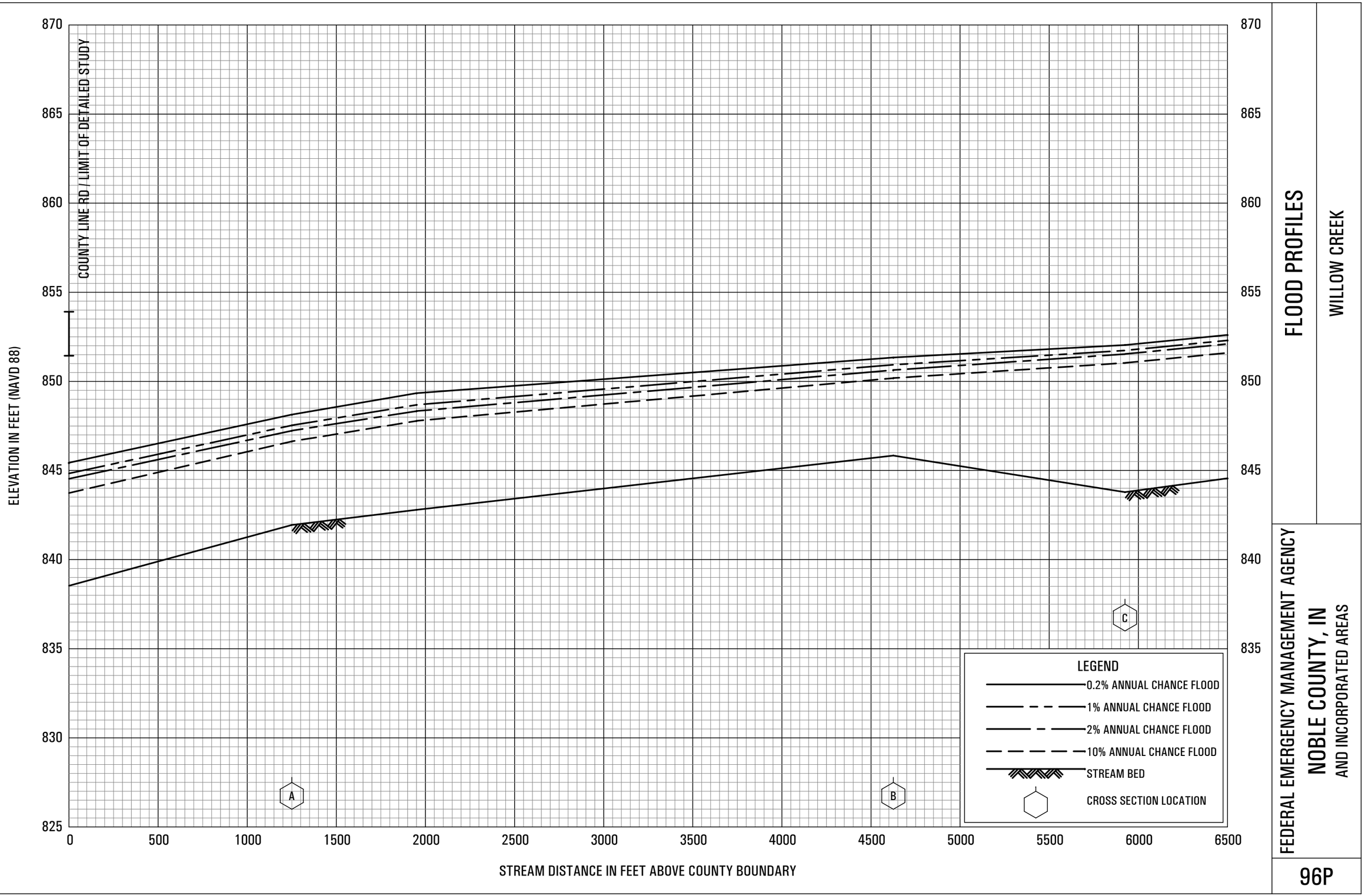
WATERHOUSE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

95P



FLOOD PROFILES

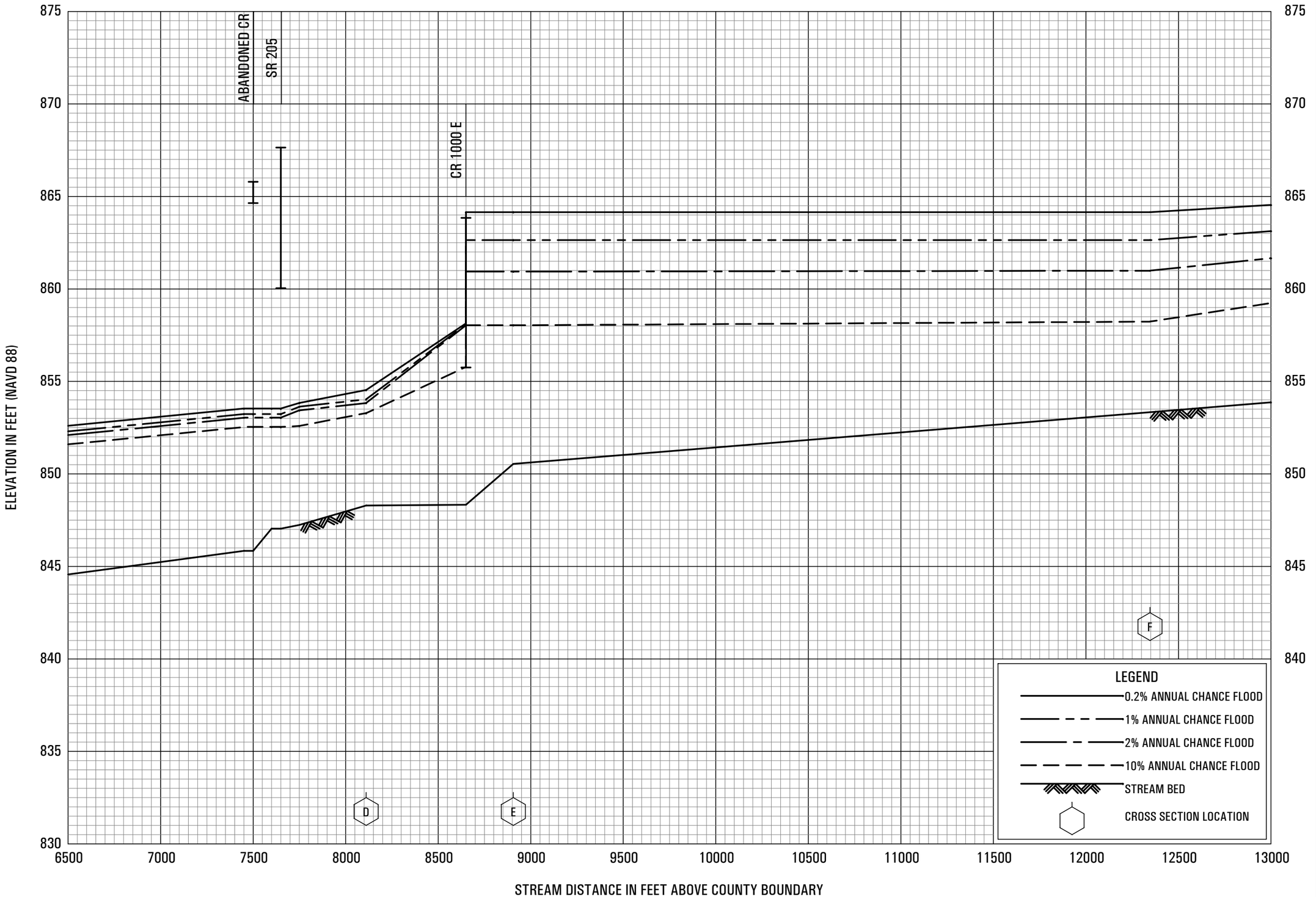
WILLOW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

96P



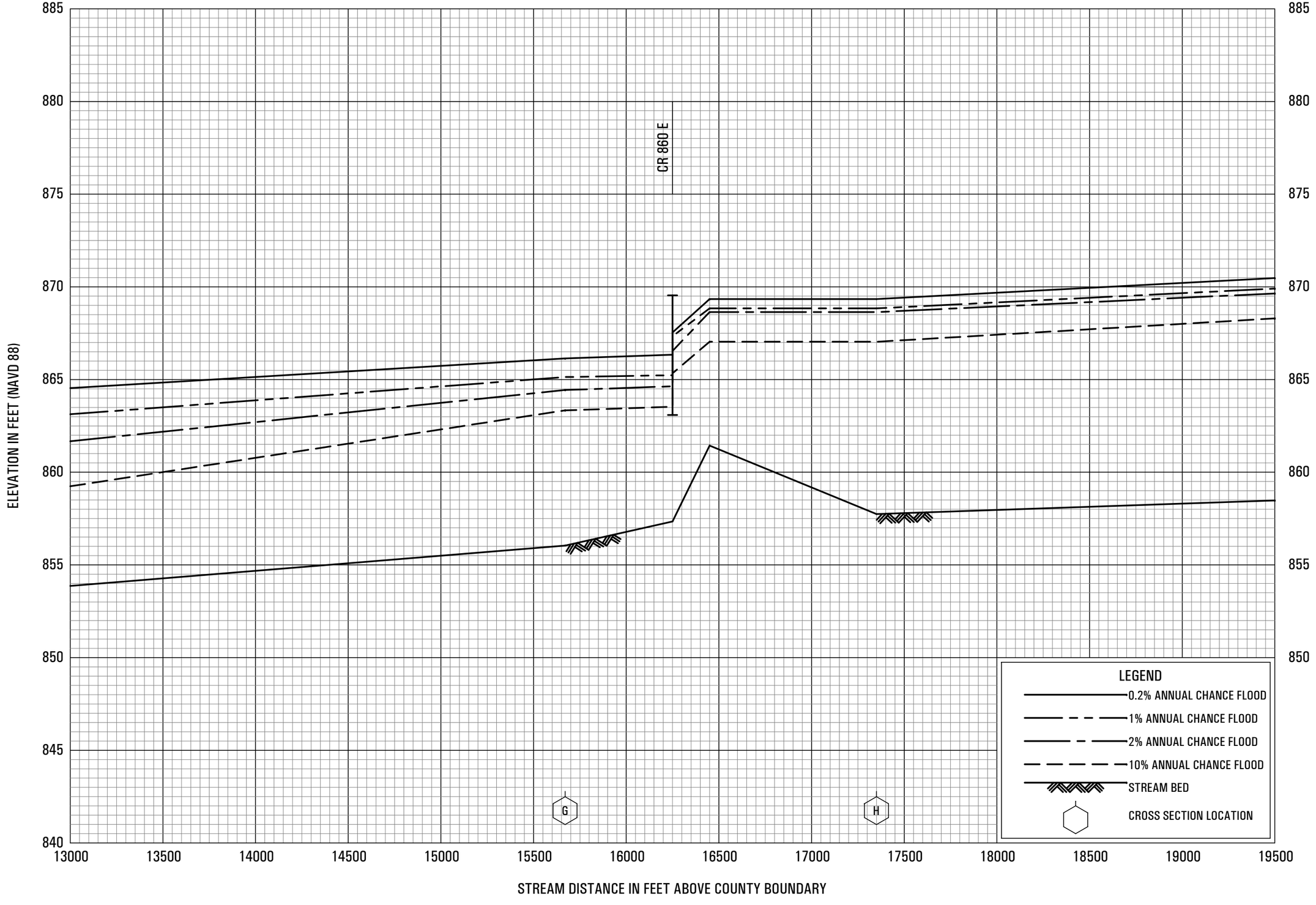
FLOOD PROFILES

WILLOW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN
AND INCORPORATED AREAS

97P



FLOOD PROFILES

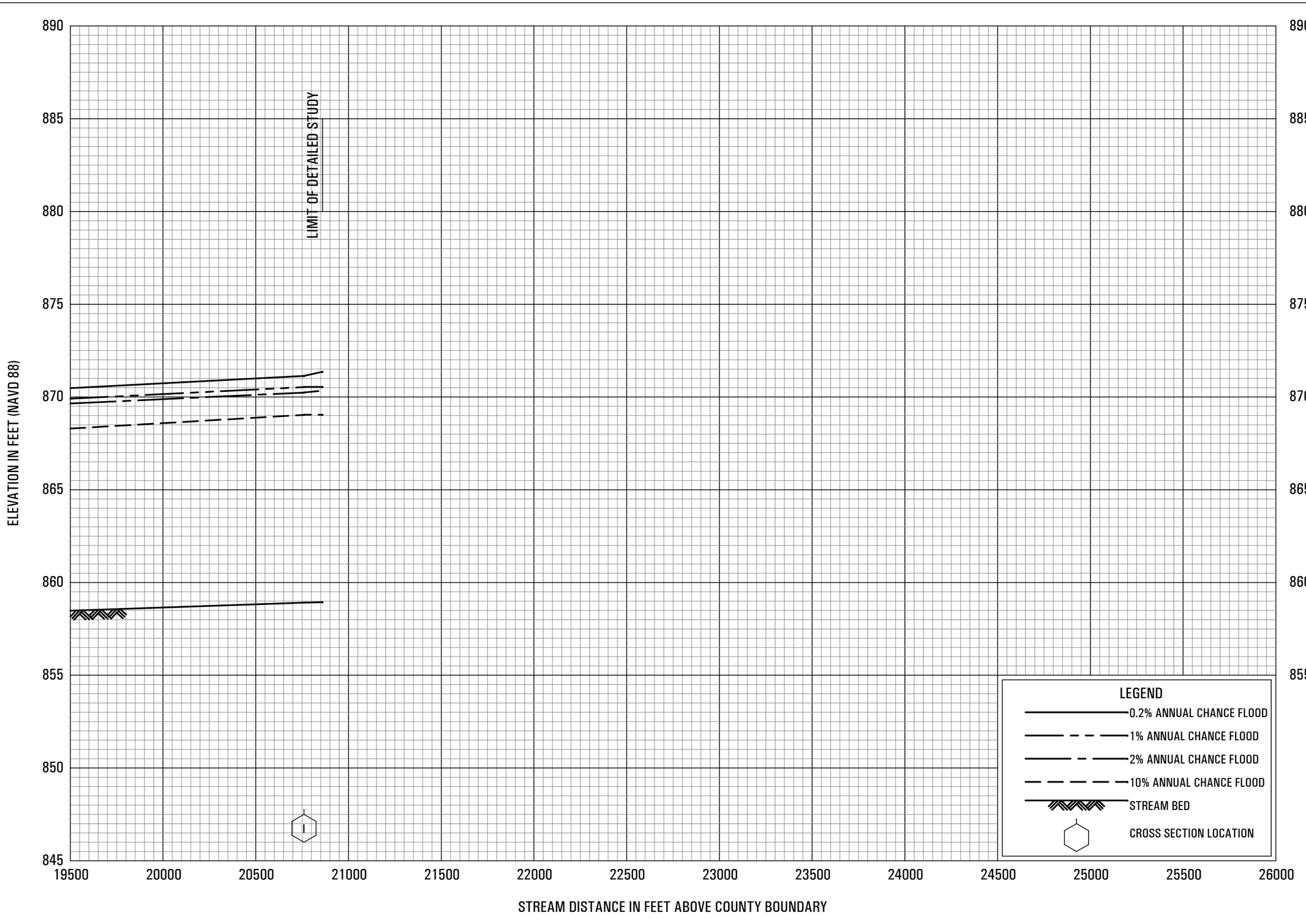
WILLOW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

98P



FLOOD PROFILES

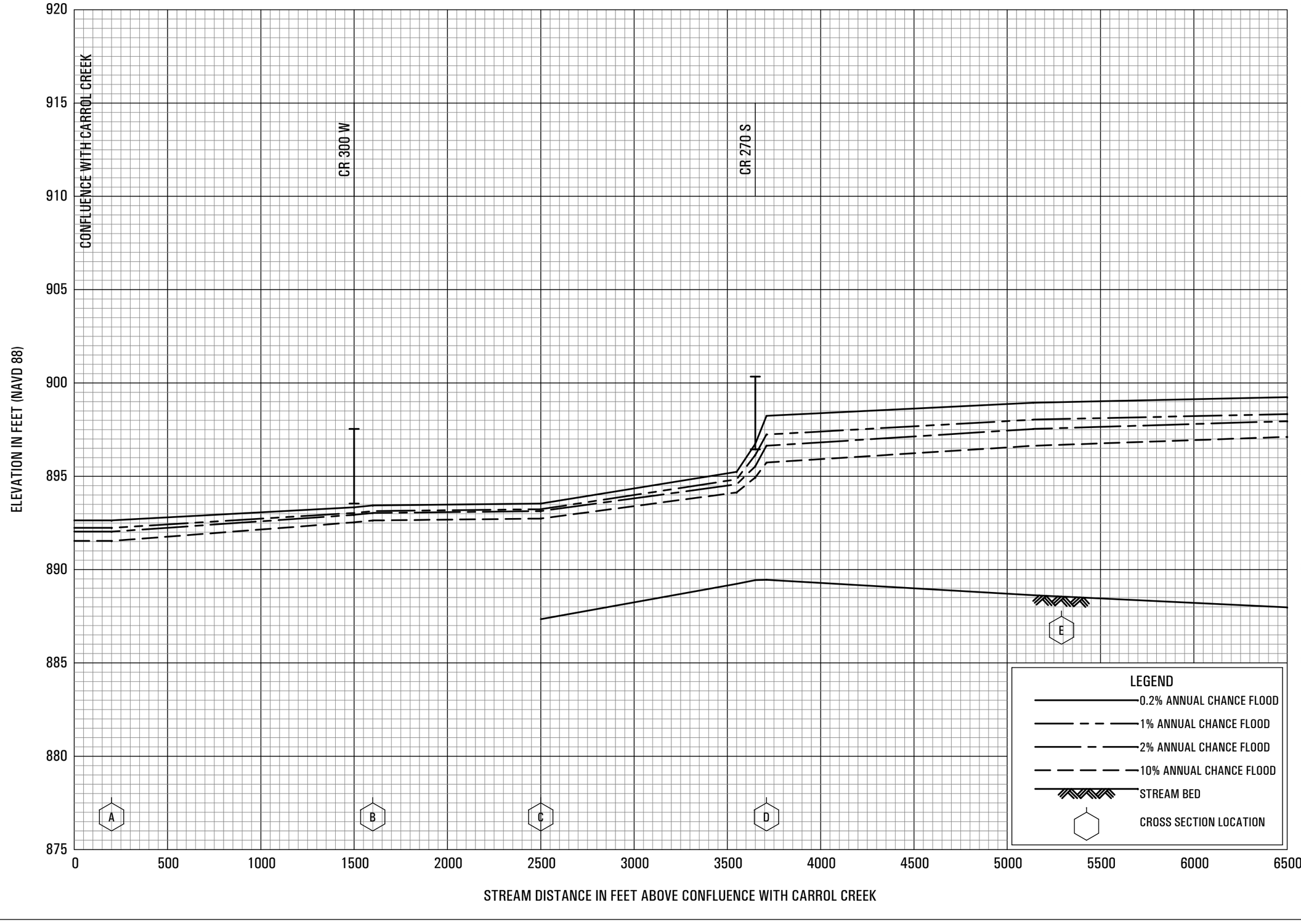
WILLOW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN

AND INCORPORATED AREAS

99P



FLOOD PROFILES

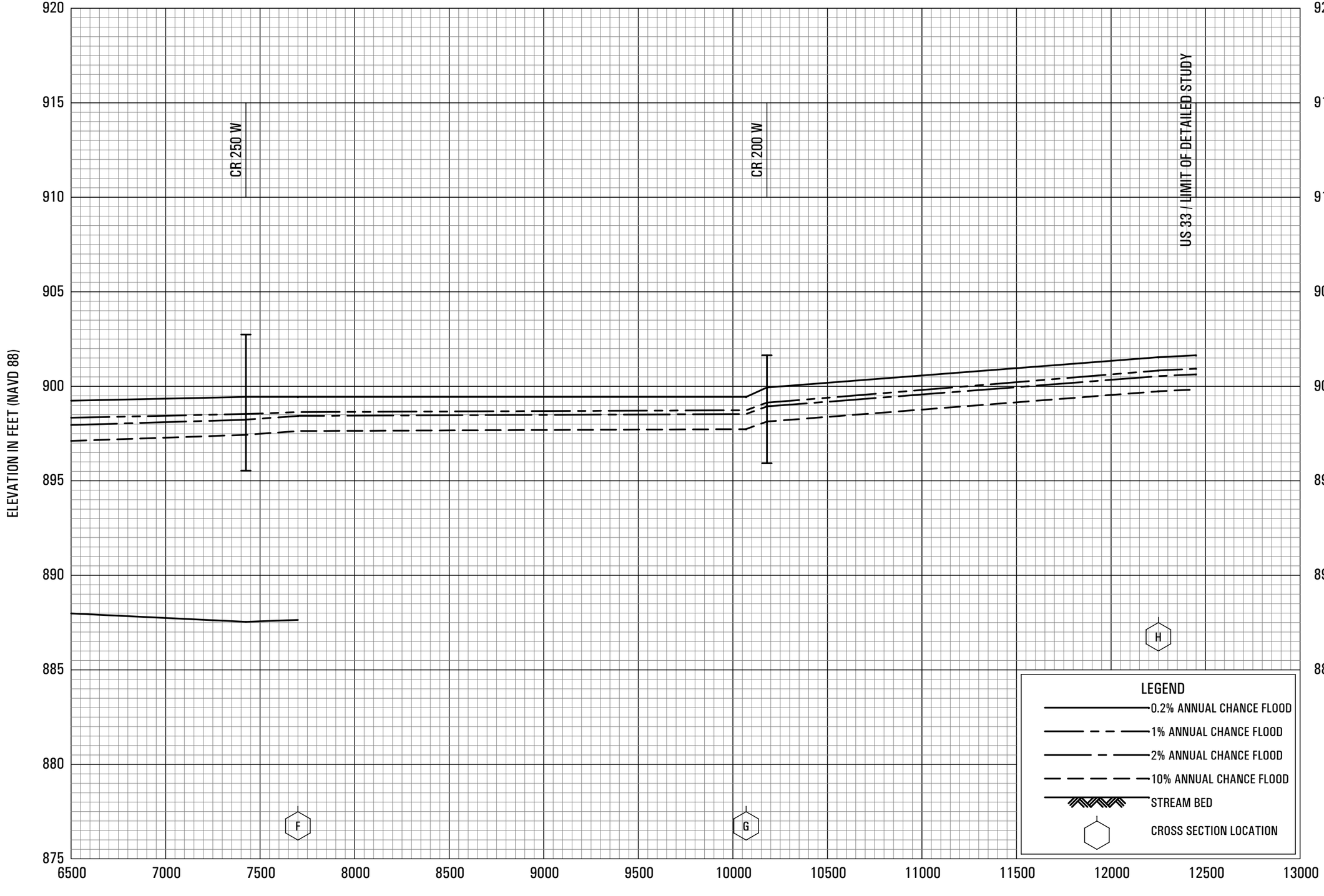
WINEBRENNER BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN, IN

AND INCORPORATED AREAS

100P



FLOOD PROFILES

WINEBRENNER BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NOBLE COUNTY, IN, IN

AND INCORPORATED AREAS